

March 12, 2013

Mr. Jason Gunter Remedial Project Manager U.S. Environmental Protection Agency Region 7 - Superfund Branch 11201 Renner Blvd. Lenexa, KS 66219

Re: The Doe Run Company - Elvins/Rivermines Mine Tailings Site Monthly Progress Report

Dear Mr. Gunter:

As required by Article VI, Section 56 of the Unilateral Administrative Order (UAO) (CERCLA-07-2005-0169) for the referenced project and on behalf of The Doe Run Company, the progress report for the period February 1, 2013 through February 28, 2013 is enclosed. If you have any questions or comments, please call me at 573-638-5020 or Mark Nations at 573-518-0800.

Sincerely,

Ty/L. Morris, P.E., R.G.

Vice President

TLM/jms Enclosures

c: Mark Nations - TDRC

Matt Wohl – TDRC (electronic only)

Mark Yingling - TDRC (electronic only)

Kathy Rangen - MDNR

Tim Skoglund - Barr Engineering

DTCR

40416604 Superfund

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Elvins/Rivermines Mine Tailings Site

Park Hills, Missouri

Removal Action - Monthly Progress Report

Period: February 1, 2013 – February 28, 2013

1. Actions Performed and Problems Encountered This Period:

- a. Continued operating the roughing filter during the period. Flow was diverted around the ZVI/sand filter, aeration tank, and final sand filter until February 21, 2013 when flow through those portions of the pilot test was resumed.
- b. Completed renovations to the ZVI/sand filter, aeration tank, and final sand filter between February 18, 2013, and February 21, 2013. Renovations to the ZVI/sand filter included: replacing the tank contents with a stratified media that included a layer of sand, a layer of pea rock, and a layer of mulch mixed with sand and pea gravel; installing several pieces of rebar vertically through the sand and pea rock layers; and adding baffles to increase contact time. The round tank is again serving as an aeration basin/settling tank and sand was replaced in the final sand filter.
- c. Continued to take analytical samples from the pilot test two to three times a week. Samples were taken from the roughing filter (RMP-Rough) through bypass pipe except for the sampling events on February 25, 2013, and February 27, 2013, when the sample was taken through the syphon hose. Following the renovations to the ZVI/sand filter, aeration tank, and final sand filter, samples were also taken from the ZVI/sand filter effluent, and final sand filter effluent.
- d. Continued to take analytical samples from the seep pond effluent and the western treatment pond effluent to monitor the metals reduction of the treatment pond.
- e. Vandalism occurred at the pilot test twice during the period. Once on February 6, 2013 and again on February 22, 2013. The pipe going into the pilot test was damaged. In both instances flow was temporarily interrupted but restored.
- f. Work continued on the task of rehabilitating the western treatment pond. This work focused on allowing the saturated media to activate. As part of the media activation process, the flow has been progressively increased and is now at full capacity. Analytical results of samples taken from the seep and western treatment pond indicate that metals reduction is occurring.

2. Analytical Data and Results Received This Period:

- a. Dissolved zinc concentrations in the pilot test effluent ranged between 7.19 mg/L and 11.42 mg/L prior to the renovations. Dissolved zinc concentrations in the pilot test effluent ranged between 6.55 mg/L and 10.42 mg/L after the renovations were completed.
- b. Total zinc concentrations in the pilot test effluent ranged between 8.18 mg/L and 12.21 mg/L prior to the renovations. Total zinc concentrations in the pilot effluent ranged between 6.63 mg/L and 10.25 mg/L after the renovations were completed.
- c. Total iron concentrations in the pilot test effluent ranged between 1.16 mg/L and 1.52 mg/L prior to the renovations. Total iron concentrations in the pilot effluent ranged between 0.25 mg/L and 0.41 mg/L after the renovations were completed.
- d. Total suspended solids concentrations in the pilot test effluent ranged between 9.0 mg/L and 31.0 mg/L after the renovations were completed. Samples were not evaluated for suspended solids prior to the renovations.
- e. Dissolved zinc and total zinc concentrations in the seep pond effluent were measured at 21.2 mg/L and 22.6 mg/L. Dissolved zinc and total zinc concentrations in the western treatment pond effluent were measured at 4.99 mg/L and 7.53 mg/L respectively.

- f. During this period, water samples were collected from just upstream of Old Missouri Highway 32, as well as from upstream and downstream of the confluence of the site discharge with Flat River. The analytical results for this event are included in this progress report.
- g. During this period, the Ambient Air Monitoring Reports for Third Quarter 2012, October 2012, and November 2012 were completed. Any issues identified in these reports are discussed below. A copy of these documents has been sent to your attention.

The Third Quarter 2012 Ambient Air Monitoring Report noted the following:

- The action levels for lead and dust were not exceeded.
- No samples were taken with the Rivermines #3 (Water Treatment Plant) TSP monitor on 07/02/12 due to mechanical failure. Upon discovery, the issue was corrected.
- No samples were taken with the TSP monitors on 07/04/12 due to the holiday.
- A QA filter blank was completed on the Rivermines #1 (Office) TSP and PM₁₀ monitors on 08/30/12.
- No samples were taken with the TSP and PM₁₀ monitors on 09/03/12 due to the holiday.
- No samples were taken with the Big River #4 (Primary) PM₁₀ monitor on 09/21/12 due to mechanical failure. Upon discovery, the issue was corrected.
- No samples were taken with the Rivermines #1 (Office) TSP and PM₁₀ monitors on 09/27/12 due to electrical issues caused by the weather. Upon discovery, these issues were corrected.
- There was a QA blank filter associated with the Rivermines #2 (North) TSP and PM₁₀ monitors on 09/28/12.

The October 2012 Ambient Air Monitoring Report noted the following:

- The action levels for lead and dust were not exceeded.
- No sample was taken with the Big River #4 (Primary) PM₁₀ monitor on 10/09/12 due to mechanical failure of the elapsed time indicator. Upon discovery, the issue was corrected.

The November 2012 Ambient Air Monitoring Report noted the following:

- The action levels for lead and dust were not exceeded.
- No sample was taken with the Big River #4 (Primary) TSP monitor on 11/02/12 due to the filter being compromised by moisture during a storm event. Upon discovery, the issue was corrected.
- The sample for Big River #4 (QA) PM₁₀ monitor was invalid on 11/05/12 due to the elapsed run time being outside of the tolerances. Upon identifying the issue, timer and sampling procedures were evaluated and the issue was corrected.
- The sample for Rivermines #1 (Office) TSP monitor was invalid on 11/15/12 due to the elapsed run time being outside of the tolerances. Upon identifying the issue, timer and sampling procedures were evaluated and the issue was corrected.
- No samples were taken with the TSP and PM_{10} monitors on 11/21/12, 11/22/12, and 11/23/12 due to the holiday.
- A QA filter blank was completed on the Rivermines #3 (Water Treatment Plant) TSP and PM₁₀ monitors on 11/27/12.

3. Developments Anticipated and Work Scheduled for Next Period:

- a. Continue analytical sampling and field measurements three times a week. No WET tests are planned.
- b. Continue monthly analytical sampling and field measurements from the seep pond and western treatment pond.
- c. Continue to operate the renovated pilot test.
- d. Complete monthly water sampling activities as described in the Removal Action Work Plan.
- e. Complete air monitoring activities as described in the Removal Action Work Plan.
- f. Continue monitoring the western treatment pond to see that the hydraulics are working properly and evaluate the metals reduction as the pond continues to come online.

Rivermines Mine Tailings Site – Monthly Progress Report Period: February 1, 2013 – February 28, 2013 Page 3

- 4. Changes in Personnel:
 - a. None.
- 5. Issues or Problems Arising This Period:
 - a. None.
- 6. Resolution of Issues or Problems Arising This Period:
 - a. None.

End of Monthly Progress Report



February 20, 2013

Allison Olds Barr Engineering Company 1001 Diamond Ridge Suite 1100 Jefferson City, MO 65109

TEL: (573) 638-5007 FAX: (573) 638-5001

RE: Rivermines NPDES WorkOrder: 13020614

Dear Allison Olds:

TEKLAB, INC received 4 samples on 2/13/2013 12:25:00 PM for the analysis presented in the following report.

Samples are analyzed on an as received basis unless otherwise requested and documented. The sample results contained in this report relate only to the requested analytes of interest as directed on the chain of custody. NELAP accredited fields of testing are indicated by the letters NELAP under the Certification column. Unless otherwise documented within this report, Teklab Inc. analyzes samples utilizing the most current methods in compliance with 40CFR. All tests are performed in the Collinsville, IL laboratory unless otherwise noted in the Case Narrative.

All quality control criteria applicable to the test methods employed for this project have been satisfactorily met and are in accordance with NELAP except where noted. The following report shall not be reproduced, except in full, without the written approval of Teklab, Inc.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Michael L. Austin

Project Manager

(618)344-1004 ex 16

MAustin@teklabinc.com



Report Contents

http://www.teklabinc.com/

Client: Barr Engineering Company

Work Order: 13020614

Client Project: Rivermines NPDES

Report Date: 20-Feb-13

This reporting package includes the following:

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Chain of Custody	Appended



Definitions

http://www.teklabinc.com/

Client: Barr Engineering Company

Work Order: 13020614

Client Project: Rivermines NPDES

Report Date: 20-Feb-13

Abbr Definition

- CCV Continuing calibration verification is a check of a standard to determine the state of calibration of an instrument between recalibration.
- DF Dilution factor is the dilution performed during analysis only and does not take into account any dilutions made during sample preparation. The reported result is final and includes all dilutions factors.
- DNI Did not ignite
- DUP Laboratory duplicate is an aliquot of a sample taken from the same container under laboratory conditions for independent processing and analysis independently of the original aliquot.
- ICV Initial calibration verification is a check of a standard to determine the state of calibration of an instrument before sample analysis is initiated.
- IDPH IL Dept. of Public Health
- LCS Laboratory control sample, spiked with verified known amounts of analytes, is analyzed exactly like a sample to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system. The acceptable recovery range is in the QC Package (provided upon request).
- LCSD Laboratory control sample duplicate is a replicate laboratory control sample that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
 - MB Method blank is a sample of a matrix similar to the batch of associated sample (when available) that is free from the analytes of interest and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedures, and in which no target analytes or interferences should present at concentrations that impact the analytical results for sample analyses.
- MDL Method detection limit means the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.
- MS Matrix spike is an aliquot of matrix fortified (spiked) with known quantities of specific analytes that is subjected to the entire analytical procedures in order to determine the effect of the matrix on an approved test method's recovery system. The acceptable recovery range is listed in the QC Package (provided upon request).
- MSD Matrix spike duplicate means a replicate matrix spike that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
- MW Molecular weight
- ND Not Detected at the Reporting Limit

NELAP NELAP Accredited

- PQL Practical quantitation limit means the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operation conditions. The acceptable recovery range is listed in the QC Package (provided upon request).
- RL The reporting limit the lowest level that the data is displayed in the final report. The reporting limit may vary according to customer request or sample dilution. The reporting limit may not be less than the MDL.
- RPD Relative percent difference is a calculated difference between two recoveries (ie. MS/MSD). The acceptable recovery limit is listed in the QC Package (provided upon request).
- SPK The spike is a known mass of target analyte added to a blank sample or sub-sample; used to determine recovery deficiency or for other quality control purposes.
- Surr Surrogates are compounds which are similar to the analytes of interest in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples.
- TNTC Too numerous to count (> 200 CFU)

Qualifiers

- # Unknown hydrocarbon
- E Value above quantitation range
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside recovery limits

- B Analyte detected in associated Method Blank
- H Holding times exceeded
- M Manual Integration used to determine area response
- R RPD outside accepted recovery limits
- X Value exceeds Maximum Contaminant Level



Case Narrative

http://www.teklabinc.com/

Work Order: 13020614

Report Date: 20-Feb-13

Client: Barr Engineering Company

Client Project: Rivermines NPDES

Cooler Receipt Temp: 3.4 °C

Locations and Accreditations

	Collinsville		Springfield		Kansas City
Address	5445 Horseshoe Lake Road	Address	3920 Pintail Dr	Address	8421 Nieman Road
	Collinsville, IL 62234-7425		Springfield, IL 62711-9415		Lenexa, KS 66214
Phone	(618) 344-1004	Phone	(217) 698-1004	Phone	(913) 541-1998
Fax	(618) 344-1005	Fax	(217) 698-1005	Fax	(913) 541-1998
Email	jhriley@teklabinc.com	Email	KKlostermann@teklabinc.com	Email	dthompson@teklabinc.com

State	Dept	Cert #	NELAP	Exp Date	Lab	_
Illinois	IEPA	100226	NELAP	1/31/2014	Collinsville	_
Kansas	KDHE	E-10374	NELAP	1/31/2014	Collinsville	
Louisiana	LDEQ	166493	NELAP	6/30/2013	Collinsville	
Louisiana	LDEQ	166578	NELAP	6/30/2013	Springfield	
Texas	TCEQ	T104704515-12-1	NELAP	7/31/2013	Collinsville	
Arkansas	ADEQ	88-0966		3/14/2013	Collinsville	
Illinois	IDPH	17584		4/30/2013	Collinsville	
Kentucky	UST	0073		5/26/2013	Collinsville	
Missouri	MDNR	00930		4/13/2013	Collinsville	
Oklahoma	ODEQ	9978		8/31/2013	Collinsville	



http://www.teklabinc.com/

Client: Barr Engineering Company

Work Order: 13020614

Client Project: Rivermines NPDES

Report Date: 20-Feb-13

Lab ID: 13020614-001

Client Sample ID: RM-001

Matrix: AQUEOUS

Collection Date: 02/12/2013 12:55

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993	(TOTAL)							TO THE
Sulfate	NELAP	500		876	mg/L	50	02/14/2013 17:44	R173751
STANDARD METHOD 4500-I	H B, LABORATORY A	NALYZED	P 11	i and		機制施設		对内部 250
Lab pH	NELAP	1.00		6.89		1	02/14/2013 7:34	R173701
STANDARD METHODS 2340	C	1.0000	西南 护士					407.79
Hardness, as (CaCO3)	NELAP	5		1020	mg/L	1	02/13/2013 15:00	R173667
STANDARD METHODS 2540	D	A NAME OF	表示。连新	A CONTRACTOR OF THE PARTY.	· Vyka	HAT AND		
Total Suspended Solids	NELAP	6		9	mg/L	1	02/13/2013 20:22	R173699
STANDARD METHODS 2540	F	1775		1841. 23	39/14		HAR BEITH OF THE	6-15
Solids, Settleable	NELAP	0.2		< 0.2	ml/L	2	02/13/2013 19:00	R173675
STANDARD METHODS 5310	C, ORGANIC CARBO	N						
Total Organic Carbon (TOC)	NELAP	1.0		9.8	mg/L	1	02/18/2013 18:19	R173874
EPA 600 4.1.1, 200.7R4.4, MI	ETALS BY ICP (DISSO	LVED)	ar see of				Shirt Francisco	
Cadmium	NELAP	2.00		< 2.00	μg/L	1	02/15/2013 14:01	85755
Zinc	NELAP	10.0	S	4990	μg/L	1	02/15/2013 14:01	85755
MS QC limits for Zn are not applic	cable due to high sample/s	pike ratio.						
EPA 600 4.1.4, 200.7R4.4, MI	ETALS BY ICP (TOTAL	-)		and the				
Cadmium	NELAP	2.00		< 2.00	μg/L	1	02/15/2013 19:15	85748
Zinc	NELAP	10.0		7050	μg/L	1	02/15/2013 19:15	85748
STANDARD METHODS 3030	D E, 3113 B, METALS E	BY GFAA						
Lead	NELAP	2.00		< 2.00	μg/L	1	02/18/2013 8:53	85762
STANDARD METHODS 3030	B, 3113 B, METALS E	Y GFAA (D	ISSOLVE	D)				
Lead	NELAP	2.00		< 2.00	μg/L	1	02/18/2013 9:44	85807



http://www.teklabinc.com/

Client: Barr Engineering Company

Work Order: 13020614

Client Project: Rivermines NPDES

Report Date: 20-Feb-13

Lab ID: 13020614-002

Client Sample ID: RM-US

Matrix: AQUEOUS

Collection Date: 02/12/2013 13:50

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993	(TOTAL)							
Sulfate	NELAP	10		26	mg/L	1	02/14/2013 17:47	R173751
STANDARD METHOD 4500-	H B, LABORATORY A	NALYZED	建 杂	1. 15 19 1/6:				
Lab pH	NELAP	1.00		8.18		1	02/14/2013 7:36	R173701
STANDARD METHODS 2340	C				William.			
Hardness, as (CaCO3)	NELAP	5		130	mg/L	1	02/13/2013 15:00	R173667
STANDARD METHODS 2540	D							
Total Suspended Solids	NELAP	6		< 6	mg/L	1	02/13/2013 20:22	R173699
STANDARD METHODS 5310	C, ORGANIC CARBO	N	在一样		Port of the			
Total Organic Carbon (TOC)	NELAP	1.0		2.7	mg/L	1	02/18/2013 18:26	R173874
EPA 600 4.1.1, 200.7R4.4, MI	ETALS BY ICP (DISSO	LVED)		n dini				
Cadmium	NELAP	2.00		< 2.00	μg/L	1	02/15/2013 14:20	85755
Zinc	NELAP	10.0		< 10.0	μg/L	1	02/15/2013 14:20	85755
EPA 600 4.1.4, 200.7R4.4, MI	ETALS BY ICP (TOTAL	_)			Variable 4			
Cadmium	NELAP	2.00		< 2.00	μg/L	1	02/15/2013 19:26	85748
Zinc	NELAP	10.0		< 10.0	μg/L	1	02/15/2013 19:26	85748
STANDARD METHODS 3030	0 E, 3113 B, METALS I	BY GFAA				N . 4 . 19		
Lead	NELAP	2.00		< 2.00	μg/L	1	02/18/2013 8:56	85762
STANDARD METHODS 3030	B, 3113 B, METALS E	Y GFAA (E	ISSOLVE	D)	Mark T			
Lead	NELAP	2.00		< 2.00	µg/L	1	02/18/2013 9:48	85807



http://www.teklabinc.com/

Client: Barr Engineering Company

Work Order: 13020614

Client Project: Rivermines NPDES

Report Date: 20-Feb-13

Lab ID: 13020614-003

Client Sample ID: RM-DS

Matrix: AQUEOUS

Collection Date: 02/12/2013 12:00

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993	(TOTAL)		A STATE OF THE STA			1		
Sulfate	NELAP	50	S	57	mg/L	5	02/14/2013 18:03	R173751
Matrix interference present in sam	ple.							
STANDARD METHOD 4500-H	HB, LABORATORY AN	NALYZED		at Take	あっまた			
Lab pH	NELAP	1.00		7.94		1	02/14/2013 7:37	R173701
STANDARD METHODS 2340	C							
Hardness, as (CaCO3)	NELAP	5		200	mg/L	1	02/13/2013 15:00	R173667
STANDARD METHODS 2540	D					4.		
Total Suspended Solids	NELAP	6		< 6	mg/L	1	02/13/2013 20:32	R173699
STANDARD METHODS 5310	C, ORGANIC CARBO	N		100	AND THE			
Total Organic Carbon (TOC)	NELAP	1.0		2.9	mg/L	1	02/18/2013 18:32	R173874
EPA 600 4.1.1, 200.7R4.4, ME	TALS BY ICP (DISSO	LVED)						
Cadmium	NELAP	2.00		< 2.00	μg/L	1	02/15/2013 14:24	85755
Zinc	NELAP	10.0		142	μg/L	1	02/15/2013 14:24	85755
EPA 600 4.1.4, 200.7R4.4, ME	TALS BY ICP (TOTAL	_)			ELEGANICAL STREET			
Cadmium	NELAP	2.00		< 2.00	μg/L	1	02/15/2013 19:30	85748
Zinc	NELAP	10.0		178	μg/L	1	02/15/2013 19:30	85748
STANDARD METHODS 3030	E, 3113 B, METALS E	BY GFAA						
Lead	NELAP	2.00		< 2.00	μg/L	1	02/18/2013 9:07	85762
STANDARD METHODS 3030	B, 3113 B, METALS B	Y GFAA (D	ISSOLVE	D)				
Lead	NELAP	2.00	ALTHROPOLIST NOT THE SELECTION	< 2.00	μg/L	1	02/18/2013 9:58	85807



http://www.teklabinc.com/

Client: Barr Engineering Company

Work Order: 13020614

Client Project: Rivermines NPDES

Report Date: 20-Feb-13

Lab ID: 13020614-004

Client Sample ID: RM-DUP

Matrix: AQUEOUS

Collection Date: 02/12/2013 0:00

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993	(TOTAL)		3277 1.27 (2012)			AT TAKE		
Sulfate	NELAP	500		966	mg/L	50	02/14/2013 18:22	R173751
STANDARD METHOD 4500-	H B, LABORATORY AN	IALYZED						9)400
Lab pH	NELAP	1.00		6.93		11	02/14/2013 7:39	R173701
STANDARD METHODS 2340	C	1.50				1101111		
Hardness, as (CaCO3)	NELAP	5		1010	mg/L	1	02/13/2013 15:00	R173667
STANDARD METHODS 2540	D					446		
Total Suspended Solids	NELAP	6		11	mg/L	1	02/13/2013 20:32	R173699
STANDARD METHODS 2540	F	17,217		77 A. 200 F.A.	4792, 447	PARTIE		
Solids, Settleable	NELAP	0.2		< 0.2	ml/L	2	02/13/2013 19:00	R173675
STANDARD METHODS 5310	C, ORGANIC CARBO	٧						
Total Organic Carbon (TOC)	NELAP	1.0		9.8	mg/L	1	02/18/2013 18:58	R173874
EPA 600 4.1.1, 200.7R4.4, MI	ETALS BY ICP (DISSO	LVED)		下版的数式外		And February		
Cadmium	NELAP	2.00		< 2.00	μg/L	1	02/15/2013 14:28	85755
Zinc	NELAP	10.0		5080	μg/L	1	02/15/2013 14:28	85755
EPA 600 4.1.4, 200.7R4.4, ME	ETALS BY ICP (TOTAL)						
Cadmium	NELAP	2.00		< 2.00	μg/L	1	02/15/2013 19:33	85748
Zinc	NELAP	10.0		7040	µg/L	1	02/15/2013 19:33	85748
STANDARD METHODS 3030	D E, 3113 B, METALS E	Y GFAA				3141377		
Lead	NELAP	2.00		< 2.00	μg/L	1	02/18/2013 9:10	85762
STANDARD METHODS 3030	B, 3113 B, METALS B	Y GFAA (D	ISSOLVE	D)		APPEN		
Lead	NELAP	2.00	F GCV - MILE PROTEST WE WITH THE	< 2.00	μg/L	1	02/18/2013 10:08	85807



Sample Summary

http://www.teklabinc.com/

Client: Barr Engineering Company

Client Project: Rivermines NPDES

Work Order: 13020614

Lab Sample ID	Client Sample ID	Matrix	Fractions	Collection Date
13020614-001	RM-001	Aqueou	s 5	02/12/2013 12:55
13020614-002	RM-US	Aqueou	5	02/12/2013 13:50
13020614-003	RM-DS	Aqueou	5	02/12/2013 12:00
13020614-004	RM-DUP	Aqueou	5	02/12/2013 0:00



Dates Report

http://www.teklabinc.com/

Client: Barr Engineering Company

Work Order: 13020614

Client Project: Rivermines NPDES

Sample ID	Client Sample ID Test Name	Collection Date	Received Date	Prep Date/Time	Analysis Date/Time
13020614-001A	RM-001	02/12/2013 12:55	02/13/2013 12:25		
	Standard Methods 2540 D		· · · · · · · · · · · · · · · · · · ·		02/13/2013 20:22
	Standard Methods 2540 F				02/13/2013 19:00
13020614-001B	RM-001	02/12/2013 12:55	02/13/2013 12:25		
	EPA 600 375.2 Rev 2.0 1993 (Total)		1000年の日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の		02/14/2013 17:44
	Standard Method 4500-H B, Laboratory Analyzed				02/14/2013 7:34
	Standard Methods 2340 C				02/13/2013 15:00
13020614-001C	RM-001	02/12/2013 12:55	02/13/2013 12:25		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			02/14/2013 14:19	02/15/2013 19:15
	Standard Methods 3030 E, 3113 B, Metals by GFAA			02/15/2013 9:10	02/18/2013 8:53
13020614-001D	RM-001	02/12/2013 12:55	02/13/2013 12:25		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)		TO THE PROPERTY OF THE PARTY.	02/14/2013 16:50	02/15/2013 14:01
	Standard Methods 3030 B, 3113 B, Metals by GFAA (I	Dissolved)		02/17/2013 15:48	02/18/2013 9:44
13020614-001E	RM-001	02/12/2013 12:55	02/13/2013 12:25		
	Standard Methods 5310 C, Organic Carbon			AND THE PROPERTY OF	02/18/2013 18:19
13020614-002A	RM-US	02/12/2013 13:50	02/13/2013 12:25		
	Standard Methods 2540 D				02/13/2013 20:22
13020614-002B	RM-US	02/12/2013 13:50	02/13/2013 12:25		
	EPA 600 375.2 Rev 2.0 1993 (Total)				02/14/2013 17:47
	Standard Method 4500-H B, Laboratory Analyzed				02/14/2013 7:36
	Standard Methods 2340 C				02/13/2013 15:00
13020614-002C	RM-US	02/12/2013 13:50	02/13/2013 12:25		
1502001,0020	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)	是一个人的		02/14/2013 14:19	02/15/2013 19:26
	Standard Methods 3030 E, 3113 B, Metals by GFAA			02/15/2013 9:10	02/18/2013 8:56
13020614-002D	RM-US	02/12/2013 13:50	02/13/2013 12:25		
13020014-002D				02/14/2013 16:50	02/15/2013 14:20
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)	Diagolyad)		02/14/2013 10:30	02/18/2013 11:20
12000011 0000	Standard Methods 3030 B, 3113 B, Metals by GFAA (I	02/12/2013 13:50	02/13/2013 12:25	02/17/2013 13.48	02/10/2013 7.10
13020614-002E	RM-US	02/12/2013 13:30	02/13/2013 12.23		02/10/2012 19 26
State of the section	Standard Methods 5310 C, Organic Carbon	02/12/2012 12 22	02/12/2012 12:25	Berling Committee	02/18/2013 18:26
13020614-003A	RM-DS	02/12/2013 12:00	02/13/2013 12:25		
	Standard Methods 2540 D		The second section is a section of	700 1700 (18.50 to 18.50 to 1	02/13/2013 20:32
13020614-003B	RM-DS	02/12/2013 12:00	02/13/2013 12:25	To A	
	EPA 600 375.2 Rev 2.0 1993 (Total)				02/14/2013 18:03
	Standard Method 4500-H B, Laboratory Analyzed				02/14/2013 7:37
	Standard Methods 2340 C				02/13/2013 15:00
13020614-003C	RM-DS	02/12/2013 12:00	02/13/2013 12:25		



Dates Report

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Client: Barr Engineering Company

Work Order: 13020614

Client Project: Rivermines NPDES

Sample ID	Client Sample ID Test Name	Collection Date	Received Date	Prep Date/Time	Analysis Date/Time
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			02/14/2013 14:19	02/15/2013 19:30
	Standard Methods 3030 E, 3113 B, Metals by GFAA			02/15/2013 9:10	02/18/2013 9:07
13020614-003D	RM-DS	02/12/2013 12:00	02/13/2013 12:25		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)	The St. ABSECT AND ACTUAL		02/14/2013 16:50	02/15/2013 14:24
	Standard Methods 3030 B, 3113 B, Metals by GFAA (I	Dissolved)		02/17/2013 15:48	02/18/2013 9:58
13020614-003E	RM-DS	02/12/2013 12:00	02/13/2013 12:25		
	Standard Methods 5310 C, Organic Carbon	TANAGETE TER			02/18/2013 18:32
13020614-004A	RM-DUP	02/12/2013 0:00	02/13/2013 12:25		
	Standard Methods 2540 D				02/13/2013 20:32
	Standard Methods 2540 F				02/13/2013 19:00
13020614-004B	RM-DUP	02/12/2013 0:00	02/13/2013 12:25		
	EPA 600 375.2 Rev 2.0 1993 (Total)	THE STATE OF THE S		A TOTAL STREET, STREET	02/14/2013 18:22
	Standard Method 4500-H B, Laboratory Analyzed				02/14/2013 7:39
	Standard Methods 2340 C				02/13/2013 15:00
13020614-004C	RM-DUP	02/12/2013 0:00	02/13/2013 12:25		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)	OF SAINS PEDAMEN OF SURVEY TO SURV		02/14/2013 14:19	02/15/2013 19:33
	Standard Methods 3030 E, 3113 B, Metals by GFAA			02/15/2013 9:10	02/18/2013 9:10
13020614-004D	RM-DUP	02/12/2013 0:00	02/13/2013 12:25		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			02/14/2013 16:50	02/15/2013 14:28
	Standard Methods 3030 B, 3113 B, Metals by GFAA (Dissolved)		02/17/2013 15:48	02/18/2013 10:08
13020614-004E	RM-DUP	02/12/2013 0:00	02/13/2013 12:25		
	Standard Methods 5310 C, Organic Carbon	THE TRANSPORT OF THE PROPERTY	જ સ્પાપનીકાર માટે અંદિયાની કેટી		02/18/2013 18:58



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Work Order: 13020614

Client Project: Rivermines NPDES

EPA 600 375.2 RE	V 2.0 1993 (T	OTAL)	100			1					4-1
Batch R173751 SampID: MBLK	SampType:			Units mg/L					1 - 11-7	1 Cala Lineia	Date Analyzed
Analyses			RL	Qual		Spike	SPK Ref Val	%REC	Low Limit	High Limit	02/14/2013
Sulfate			10		< 10						02/14/2013
Batch R173751	SampType:	LCS		Units mg/L					-		
SampID: LCS											Date Analyzed
Analyses			RL	Qual	Result		SPK Ref Val			High Limit	
Sulfate			10		22	20	0	109.0	90	110	02/14/2013
Batch R173751 SampID: 13020614-	SampType: 003BMS	MS	1 8	Units mg/L		h'					Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Sulfate			50	S	94	50	56.76	75.2	90	110	02/14/2013
Batch R173751 SampID: 13020614-	SampType: -003BMSD	MSD		Units mg/L	*		1.4			Limit 10	Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref	/al %RPD	Analyzed
Sulfate			50	S	97	50	56.76	81.1	94.34	3.11	02/14/2013
Batch R173826 SampID: MBLK	SampType:	MBLK		Units mg/L		-					Date Analyzed
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Sulfate			10		< 10						02/15/2013
Batch R173826 SampID: LCS	SampType:	LCS		Units mg/L					1,13		Date Analyzed
Analyses			RL	Qual	Result	Spike	SPK Ref Val			High Limit	
Sulfate			10		21	20	0	107.0	90	110	02/15/2013
STANDARD METH	IOD 4500-H	B, LAB	ORATO	RY ANALYZED				Gara 13			
Batch R173701 SampID: LCS	SampType:			Units							Date Analyzed
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	
Lab pH			1.00		7.03	7.00	0	100.4	99.1	100.8	02/14/2013
	SampType:	DUP		Units					RPD	Limit 10	
Batch R173701											Data
Batch R173701 SampID: 13020614-	-001BDUP		RL	Qual	Remlt	Spike	SPK Ref Val	%REC	RPD Ref	Val %RPD	Date Analyzed



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STANDARD METHOD 4500-H E	B, LAB	BORATO	ORY ANALYZE	D			1011			
Batch R173701 SampType: SampID: 13020614-002BDUP	DUP		Units					RP	D Limit 10	Date
Analyses		RL	Qual	Resul	t Spike	SPK Ref Va	I %REC	RPD Ref	Val %RPD	Analyzed
Lab pH		1.00	-	8.16				8.180	0.24	02/14/2013
Batch R173701 SampType:	DUP		Units					RP	D Limit 10	
SampID: 13020614-003BDUP										Date
Analyses		RL	Qual	Resul	t Spike	SPK Ref Va	I %REC	RPD Ref	Val %RPD	Analyzed
Lab pH		1.00		7.94				7.940	0.00	02/14/2013
Batch R173701 SampType: SampID: 13020614-004BDUP	DUP		Units		P .	1		RPI	D Limit 10	Data
Analyses		RL	Qual	Resul	t Spike	SPK Ref Va	I %REC	RPD Ref	Val %RPD	Date Analyzed
Lab pH		1.00		6.92			-	6.930	0.14	02/14/2013
STANDARD METHODS 2340 C		7.7						All Property and	1000	
Batch R173667 SampType:	MBLK		Units mg/L	AND REAL PROPERTY OF THE CO.		EXCEPT ON A STREET	SACRET SECRETARIO			
SampID: MB-R173667										Date
Analyses		RL	Oual	Result	Snike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Hardness, as (CaCO3)		5		< 5						02/13/2013
Batch R173667 SampType:	LCS		Units mg/L	1					8	- X
SampID: LCS-R173667 Analyses		RL	Qual	Dogult	C-:1	SPK Ref Val	0/ DEC	I over Limeit	I Bala I South	Date Analyzed
Hardness, as (CaCO3)		5	Quai	1020	Spike 1000	0	102.0	90	High Limit 110	02/13/2013
Batch R173667 SampType:	Me		Unito mall							
SampID: 13020614-001BMS	IVIO		Units mg/L							
Analyses		RL	Qual	D14	G 1	SPK Ref Val	0/ DEC	Laur Limit	Treate Leaving	Date Analyzed
Hardness, as (CaCO3)		5	Quai	1240	Spike 200	1020	110.0	85	High Limit	02/13/2013
	MSD		Units mg/L					RPD	Limit 10	
SampID: 13020614-001BMSD										Date
Analyses		RL	Qual			SPK Ref Val			/al %RPD	Analyzed
Hardness, as (CaCO3)		5		1230	200	1020	105.0	1240	0.81	02/13/2013
STANDARD METHODS 2540 D	State of the state									
Batch R173699 SampType: M SampID: MBLK	MBLK		Units mg/L		, ¹					Date
Analyses		RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Total Suspended Solids		6		< 6						02/13/2013



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STANDARD METHO	DS 2540 D	1 1	1		10 pt 10			- N			7
Batch R173699 S	SampType:			Units mg/L							Date
SampID: LCS			n.	0 1	D 1	0.1	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Analyses			RL	Qual					85	115	02/13/2013
Total Suspended So			6		98	100	0	98.0	85	115	02/13/2013
Total Suspended So			6		97	100	0	97.0			02/13/2013
Total Suspended So	lids		6		95	100	0	95.0	85	115	
Total Suspended So	lids		6		93	100	0	93.0	85	115	02/13/2013
Total Suspended So	lids		6		107	100	0	107.0	85	115	02/13/2013
Batch R173699 S	SampType:	DUP		Units mg/L					RPC	Limit 15	¥ .
SampID: 13020614-00	02A DUP										Date
Analyses			RL	Qual	Result	Snike	SPK Ref Val	%REC	RPD Ref	Val %RPD	Analyzed
Total Suspended So	olids		6	Quai	< 6	Брис			0	0.00	02/13/2013
	angaran agaras	14 (<u>14 4 4 4 1</u> 1	San San San San					7 Mo + 9 + 12 + 2			
STANDARD METHO								er ziskirki (s. ji	1,000,000,000,000		300, 450, 650
Batch R173874 S	SampType:	MBLK		Units mg/L							
SampID: ICB/MBLK											Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Total Organic Carbo	n (TOC)		1.0	~	< 1.0	•					02/18/2013
Batch R173874 S	SampType:	LCS		Units mg/L					- x		
SampID: ICV/LCS								6			Date Analyzed
Analyses		. * .	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit		1 1 1 1 1
Total Organic Carbo	n (TOC)		10.0		62.4	59.7	0	104.6	90	110	02/18/2013
Batch R173874 S	SampType:	MS		Units mg/L							
SamplD: 13020614-00	03EMS										Date
			RL	Qual	Result	Snike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Analyses Total Organic Carbo	on (TOC)		1.0	Quai	7.6	5.0	2.910	93.0	85	115	02/18/2013
D470074 (CT	Med		Units mg/L			3274		RPI	Limit 10	
THE PARTY OF THE P	SampType:	MSD		Office Hig/L							Date
SampID: 13020614-00	03EM2D								DDD D (1	V-1 0/000	Analyzed
Analyses			RL	Qual	Result		SPK Ref Val			Val %RPD	100
Total Organic Carbo	on (TOC)		1.0		7.8	5.0	2.910	97.0	7.560	2.61	02/18/2013
EPA 600 4.1.1, 200.7	7R4.4, MET	TALS B	Y ICP (E	ISSOLVED)						Park in	
The second contract of the second sec	SampType:			Units µg/L	1 2 9001					11	
SamplD: MB-85755											Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Cadmium			2.00	- Gara	< 2.00	2.00	0	0	-100	100	02/15/2013
Zinc			10.0		< 10.0	10.0	0	0	-100	100	02/15/2013
ZIIIG			10.0					-			



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Batch 85755	SampType:	LCS		Units µg/L							
SamplD: LCS-85755											Date
Analyses			RL	Qual	Result	Snike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Cadmium			2.00	Q uui	45.8	50.0	0	91.6	85	115	02/15/2013
Zinc			10.0		460	500	0	91.9	85	115	02/15/2013
Batch 85755 S	SampType: 01DMS	MS		Units µg/L						3	Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Cadmium			2.00		44.2	50.0	0	88.4	75	125	02/15/2013
Zinc			10.0	S	5250	500	4990	52.6	75	125	02/15/2013
Batch 85755 SamplD: 13020614-00	SampType: 01DMSD	MSD		Units µg/L			, .		RPD	Limit 20	Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref \	/al %RPD	Analyzed
Cadmium			2.00		45.3	50.0	0	90.6	44.2	2.46	02/15/2013
Zinc			10.0	S	5330	500	4990	68.2	5253	1.47	02/15/2013
EPA 600 4.1.4, 200.7	'R4.4, MET	ALS B	Y ICP (T	OTAL)							
Batch 85748 S	SampType:	MBLK	,	Units µg/L					ELECTRIC SERVICE CONTROL SERVICE		
				1.5							
SampID: MB-85748				10							Date
SampID: MB-85748 Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
					Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Analyses			RL								
Analyses Cadmium Zinc	SampType:		RL 2.00		< 2.00	2.00	0	0	-100	100	Analyzed 02/15/2013
Analyses Cadmium Zinc Batch 85748			RL 2.00	Qual	< 2.00	2.00	0	0	-100	100	Analyzed 02/15/2013 02/15/2013
Analyses Cadmium Zinc Batch 85748 S SampID: LCS-85748			RL 2.00 10.0	Qual Units µg/L	< 2.00 < 10.0	2.00	0	0	-100 -100	100	Analyzed 02/15/2013 02/15/2013 Date Analyzed
Analyses Cadmium Zinc Batch 85748 SampID: LCS-85748 Analyses			RL 2.00 10.0	Qual Units µg/L	< 2.00 < 10.0	2.00 10.0 Spike	0 0 SPK Ref Val	0 0 %REC	-100 -100 Low Limit	100 100 High Limit	Analyzed 02/15/2013 02/15/2013 Date
Analyses Cadmium Zinc Batch 85748 S SampID: LCS-85748 Analyses Cadmium Zinc	SampType: SampType:	LCS	RL 2.00 10.0	Qual Units µg/L	< 2.00 < 10.0 Result	2.00 10.0 Spike 50.0	0 0 SPK Ref Val	0 0 %REC 98.8	-100 -100 Low Limit 85	100 100 High Limit	Analyzed 02/15/2013 02/15/2013 Date Analyzed 02/15/2013 02/15/2013
Analyses Cadmium Zinc Batch 85748 S SampID: LCS-85748 Analyses Cadmium Zinc Batch 85748 S SampID: 13020614-00	SampType: SampType:	LCS	RL 2.00 10.0	Qual Units µg/L Qual Units µg/L	< 2.00 < 10.0 Result 49.4 494	2.00 10.0 Spike 50.0 500	0 0 SPK Ref Val 0 0	0 0 %REC 98.8 98.9	-100 -100 Low Limit 85 85	100 100 High Limit 115 115	Analyzed 02/15/2013 02/15/2013 Date Analyzed 02/15/2013
Analyses Cadmium Zinc Batch 85748 S SampID: LCS-85748 Analyses Cadmium Zinc Batch 85748 S SampID: 13020614-00 Analyses	SampType: SampType:	LCS	RL 2.00 10.0 RL 2.00 10.0	Qual Units µg/L Qual	< 2.00 < 10.0 Result 49.4 494	2.00 10.0 Spike 50.0 500	O O O O O O O O O O O O O O O O O O O	0 0 %REC 98.8 98.9	-100 -100 Low Limit 85 85	High Limit 115 115	Date Analyzed 02/15/2013 Date Analyzed 02/15/2013 Date Analyzed
Analyses Cadmium Zinc Batch 85748 S SampID: LCS-85748 Analyses Cadmium Zinc Batch 85748 S SampID: 13020614-00	SampType: SampType:	LCS	RL 2.00 10.0	Qual Units µg/L Qual Units µg/L	< 2.00 < 10.0 Result 49.4 494	2.00 10.0 Spike 50.0 500	O O O O O O O O O O O O O O O O O O O	0 0 %REC 98.8 98.9	-100 -100 Low Limit 85 85	100 100 High Limit 115 115	Analyzed 02/15/2013 02/15/2013 Date Analyzed 02/15/2013 02/15/2013
Analyses Cadmium Zinc Batch 85748 S SampID: LCS-85748 Analyses Cadmium Zinc Batch 85748 S SampID: 13020614-00 Analyses Cadmium Zinc	SampType: SampType:	LCS	RL 2.00 10.0 RL 2.00 10.0	Qual Units µg/L Qual Units µg/L	< 2.00 < 10.0 Result 49.4 494 Result 49.9	2.00 10.0 Spike 50.0 500	O O O O O O O O O O O O O O O O O O O	0 0 %REC 98.8 98.9 %REC	-100 -100 Low Limit 85 85 Low Limit 75	100 100 High Limit 115 115 High Limit 125	Date Analyzed 02/15/2013 Date Analyzed 02/15/2013 Date Analyzed 02/15/2013
Analyses Cadmium Zinc Batch 85748 S SampID: LCS-85748 Analyses Cadmium Zinc Batch 85748 S SampID: 13020614-00 Analyses Cadmium Zinc	SampType: SampType:	LCS	RL 2.00 10.0 RL 2.00 10.0	Qual Units µg/L Qual Units µg/L Qual	< 2.00 < 10.0 Result 49.4 494 Result 49.9	2.00 10.0 Spike 50.0 500	O O O O O O O O O O O O O O O O O O O	0 0 %REC 98.8 98.9 %REC	-100 -100 Low Limit 85 85 Low Limit 75	100 100 High Limit 115 115 High Limit 125 125	Date Analyzed 02/15/2013 Date Analyzed 02/15/2013 Date Analyzed 02/15/2013
Analyses Cadmium Zinc Batch 85748 S SampID: LCS-85748 Analyses Cadmium Zinc Batch 85748 S SampID: 13020614-00 Analyses Cadmium Zinc Batch 85748 S SampID: 13020614-00	SampType: SampType:	LCS	RL 2.00 10.0 RL 2.00 10.0	Qual Units µg/L Qual Units µg/L Qual	< 2.00 < 10.0 Result 49.4 494 Result 49.9	2.00 10.0 Spike 50.0 500 Spike 50.0 500	SPK Ref Val 0 0 SPK Ref Val 1 7050	%REC 98.8 98.9 %REC 97.8 99.8	-100 -100 Low Limit 85 85 Low Limit 75	100 100 High Limit 115 115 High Limit 125 125	Analyzed 02/15/2013 02/15/2013 Date Analyzed 02/15/2013 Date Analyzed 02/15/2013 02/15/2013
Analyses Cadmium Zinc Batch 85748 S SampID: LCS-85748 Analyses Cadmium Zinc Batch 85748 S SampID: 13020614-00 Analyses Cadmium Zinc Batch 85748 S SampID: 13020614-00	SampType: SampType:	LCS	RL 2.00 10.0 RL 2.00 10.0	Qual Units µg/L Qual Units µg/L Qual	< 2.00 < 10.0 Result 49.4 494 Result 49.9 7550	2.00 10.0 Spike 50.0 500 Spike 50.0 500	SPK Ref Val 0 SPK Ref Val 1 7050	%REC 98.8 98.9 %REC 97.8 99.8	-100 -100 Low Limit 85 85 Low Limit 75 75	100 100 High Limit 115 115 High Limit 125 125	Analyzed 02/15/2013 02/15/2013 Date Analyzed 02/15/2013 Date Analyzed 02/15/2013 02/15/2013



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Client: Barr Engineering Company

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Client Project: Rivermines NPDES

			B, ME I	ALS BY GFAA	14 1		and the second				The state of the s
Duten	SampType:	MBLK		Units µg/L							Dete
SampID: MB-85762								**550	1 1 !!4	Llimb Limit	Date Analyzed
Analyses			RL	Qual	Result		SPK Ref Val			High Limit	
Lead			2.00		< 2.00	2.00	0	0	-100	100	02/18/2013
Duten	SampType:	LCS		Units µg/L							Data
SampID: LCS-85762					1000		0DKD ()/-1	N/DEO	Loui Limit	High Limit	Date Analyzed
Analyses			RL	Qual	Result					115	02/18/2013
Lead			2.00		14.1	15.0	0	93.7	85	115	02/10/2013
Batch 85762	SampType:	MS		Units µg/L							
SampID: 13020614-0	02CMS										Date
Analyses			RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Lead			2.00		15.0	15.0	0.6836	95.4	70	130	02/18/2013
D . 1 05762	SampType:	MSD		Units µg/L					RPD	Limit 20	
Batch 85762 SampID: 13020614-0		MOD		omo µg/=							Date
	02CIVIOD		DI	Ovel	Result	Snika	SPK Ref Val	%REC	RPD Ref \	Val %RPD	Analyzed
Analyses			RL 2.00	Qual	14.9	15.0	0.6836	95.1	14.9896	0.31	02/18/2013
Lead			2.00		14.3	10.0	0.0000	00.1			
STANDARD METHO	DDS 3030 B	, 3113	в, метл	ALS BY GFAA (DISSOL	.VED)					
	DDS 3030 B SampType:		B, MET	ALS BY GFAA (Units µg/L	DISSOL	.VED)					
			B, MET		DISSOL	VED)					Date Analyzed
Batch 85807 SampID: MB-85807			B, META			VED) Spike	SPK Ref Val	%REC	Low Limit	High Limit	Analyzed
Batch 85807				Units µg/L			SPK Ref Val	%REC 0	Low Limit	High Limit	
Batch 85807 SampID: MB-85807 Analyses Lead	SampType:	MBLK	RL	Units µg/L	Result	Spike		The second second	Gora And Cold Cold Till Street		Analyzed
Batch 85807 SampID: MB-85807 Analyses Lead Batch 85807		MBLK	RL	Units µg/L Qual	Result	Spike		The second second	Gora And Cold Cold Till Street		Analyzed 02/18/2013 Date
Batch 85807 SampID: MB-85807 Analyses Lead Batch 85807 SampID: LCS-85807	SampType:	MBLK	RL 2.00	Units µg/L Qual Units µg/L	Result	Spike 2.00		0	-100		Analyzed 02/18/2013
Batch 85807 SampID: MB-85807 Analyses Lead Batch 85807	SampType:	MBLK	RL	Units µg/L Qual	Result	Spike	0	0	-100	100	Analyzed 02/18/2013 Date
Batch 85807 SampID: MB-85807 Analyses Lead Batch 85807 SampID: LCS-85807 Analyses Lead	SampType:	LCS	RL 2.00	Oual Oual Units µg/L Qual	Result	Spike 2.00	0 SPK Ref Val	0 %REC	-100 Low Limit	100 High Limit	Analyzed 02/18/2013 Date Analyzed
Batch 85807 SampID: MB-85807 Analyses Lead Batch 85807 SampID: LCS-85807 Analyses Lead Batch 85807	SampType: SampType:	MBLK	RL 2.00	Units µg/L Qual Units µg/L	Result	Spike 2.00	0 SPK Ref Val	0 %REC	-100 Low Limit	100 High Limit	Analyzed 02/18/2013 Date Analyzed
Batch 85807 SampID: MB-85807 Analyses Lead Batch 85807 SampID: LCS-85807 Analyses Lead Batch 85807 SampID: 13020614-0	SampType: SampType:	LCS	RL 2.00	Units µg/L Qual Units µg/L Qual Units µg/L	Result < 2.00 Result 13.8	Spike 2.00 Spike 15.0	0 SPK Ref Val 0	%REC 92.0	-100 Low Limit 85	High Limit	02/18/2013 Date Analyzed 02/18/2013
Batch 85807 SampID: MB-85807 Analyses Lead Batch 85807 SampID: LCS-85807 Analyses Lead Batch 85807 SampID: 13020614-0 Analyses	SampType: SampType:	LCS	RL 2.00	Oual Oual Units µg/L Qual	Result 13.8 Result	Spike 2.00	0 SPK Ref Val 0	%REC 92.0	-100 Low Limit 85	100 High Limit	Analyzed 02/18/2013 Date Analyzed 02/18/2013 Date
Batch 85807 SampID: MB-85807 Analyses Lead Batch 85807 SampID: LCS-85807 Analyses Lead Batch 85807 SampID: 13020614-0	SampType: SampType:	LCS	RL 2.00 RL 2.00	Units µg/L Units µg/L Qual Units µg/L Qual	Result 13.8 Result	Spike 2.00 Spike 15.0	O SPK Ref Val	%REC 92.0	Low Limit 85 Low Limit 70	High Limit 115 High Limit 130	Analyzed 02/18/2013 Date Analyzed 02/18/2013 Date Analyzed
Batch 85807 SampID: MB-85807 Analyses Lead Batch 85807 SampID: LCS-85807 Analyses Lead Batch 85807 SampID: 13020614-0 Analyses Lead	SampType: SampType:	LCS MS	RL 2.00 RL 2.00	Units µg/L Qual Units µg/L Qual Units µg/L	Result 13.8 Result	Spike 2.00 Spike 15.0	O SPK Ref Val	%REC 92.0	Low Limit 85 Low Limit 70	High Limit 115 High Limit	Date Analyzed 02/18/2013 Date Analyzed 02/18/2013 Date Analyzed 02/18/2013
Batch 85807 SampID: MB-85807 Analyses Lead Batch 85807 SampID: LCS-85807 Analyses Lead Batch 85807 SampID: 13020614-0 Analyses Lead	SampType: SampType: 002DMS SampType:	LCS MS	RL 2.00 RL 2.00	Units µg/L Units µg/L Qual Units µg/L Qual	Result < 2.00 Result 13.8 Result 14.8	Spike 2.00 Spike 15.0 Spike 15.0	O SPK Ref Val O SPK Ref Val O	%REC 92.0 %REC 98.9	Low Limit 85 Low Limit 70	High Limit 115 High Limit 130 Limit 20	Analyzed 02/18/2013 Date Analyzed 02/18/2013 Date Analyzed 02/18/2013
Batch 85807 SampID: MB-85807 Analyses Lead Batch 85807 SampID: LCS-85807 Analyses Lead Batch 85807 SampID: 13020614-0 Analyses Lead Batch 85807	SampType: SampType: 002DMS SampType:	LCS MS	RL 2.00 RL 2.00	Units µg/L Units µg/L Qual Units µg/L Qual	Result 13.8 Result 14.8 Result	Spike 2.00 Spike 15.0 Spike 15.0	O SPK Ref Val	%REC 92.0 %REC 98.9	Low Limit 85 Low Limit 70	High Limit 115 High Limit 130	Date Analyzed 02/18/2013 Date Analyzed 02/18/2013 Date Analyzed 02/18/2013



Receiving Check List

http://www.teklabinc.com/

Client: Barr Engineering Company lient Project: Rivermines NPDES					der: 13020614 Date: 20-Feb-13
Carrier: Rich Mannz	Receiv	ed By: TV	VM	-	
Completed by: On: 13-Feb-13 Emily E. Pohlman	Revie Oi 13-Fe		MULAL Michael L. Austin		
Pages to follow: Chain of custody 1	Extra pages included	0]		<u> </u>
Shipping container/cooler in good condition?	Yes 🗹	No 🗌	Not Present		Temp °C 3.4
Type of thermal preservation?	None	Ice 🗹	Blue Ice		Dry Ice
Chain of custody present?	Yes 🗹	No 🗌			•
Chain of custody signed when relinquished and received?	Yes 🗹	No 🗌			
Chain of custody agrees with sample labels?	Yes 🗹	No 🗌			
Samples in proper container/bottle?	Yes 🗹	No 🔲			
Sample containers intact?	Yes 🗹	No 🗔			
Sufficient sample volume for indicated test?	Yes 🗹	No 🗀			
All samples received within holding time?	Yes 🗹	No 🗌		_	
Reported field parameters measured:	Field 🔲	Lab 🗹	NA		
Container/Temp Blank temperature in compliance?	Yes 🗹	No 🗆			
When thermal preservation is required, samples are complian 0.1°C - 6.0°C, or when samples are received on ice the same		etween			
Water – at least one vial per sample has zero headspace?	Yes 🗔	No 🗆	No VOA vials	~	
Water - TOX containers have zero headspace?	Yes 🗀	No 🗌	No TOX containers	✓	
Water - pH acceptable upon receipt?	Yes 🗹	No 🗌			
NPDES/CWA TCN interferences checked/treated in the field?	Yes 🗌	No 🗌	NA	✓	
Any No responses n	nust be detailed below	or on the	COC.		

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	Chain of Custody 1001 Diamond Ridge, Suite 1100								Ł							CC	C 1 of 1													
BARR	1001 Dia Jefferson	mond Rid City, MO	ge, Suite 65109	1100											Wa	ter						5	Soil						C 1 01 1	_
	(573) 638	8-5000																				T				7	ı	Project Manager: T	y Morris	
Project Number:	25860009.	00 TLM 0	21																							-	ည			
Project Name: R	ivermines	NPDES					-										1				/# (I			unpres.		Í	taine	Project QC Contact:	Andrea N	ord
Sample Originati	mple Origination State: MO (use two letter postal state abbreviation)										Solids		noc					H)#1	MeO	erved	ed) #2			ł	Con					
COC Number: R	MP 021213												ded S	Solids	c Carbon		als			MeO	(tared McOH)	npres	eserved)				er of	Sampled By:	Stephen 1	Moilanen
							1	Matrix		Туре	e		Suspended	۾ ا	Organic	stals	d Met	SS		tared	BTE (ared t	id la	Solids (plastic		Ì	Vumb	Laboratory:	Teklab	
Location	1	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Water	Soil	Grab	Comp	ς,		Total S	· Sultate	Total O	• Total Metals	Dissolved Metals	• Hardness		VOCs (tared MeOH)	GRO, E	DRO (tared unpreserved)	SVOCs (unpreserved)	% Solic			Total Number of Containers			
1. RM-001	-001				02/12/13	j2:,55	x		x			x	x	x :	x x	х	х	x								1	5	Preservatives: Unpreserved	2 HNO3, 1	H2SO4, 2
2. RM-US	<u>-001</u>				02/12/13	13:50	_		×					x	x												5	Preservatives: Unpreserved	2 HNO3,	H2SO4, 2
3. RM-DS	- 003				02/12/13	12:00			x					x	x		x									T	5	Preservatives: Unpreserved	2 HNO3,	H2SO4, 2
4. RM-DUP	-204				02/12/13	:	х		х			x	х	x /	$\langle \rangle_{x}$	x	х	X									5	Preservatives: Unpreserved	2 HNO3,	H2SO4, 2
5.																														
6.																														
7.																														
8.		1				Ì																								
Comments: Inv at Doe Run. Matrix is surface Metals include 0	e water.			Run. Resi	ilts to be sent to	Allison Old	s (aol	lds@bar	T.com)	at B	arr Eng	gine	ering	g, An	drea	No	rd (a	anor	d@ba	arr.c	om)	at B	arr I	Engi	neeri	ing,	and N	Mark Nations (m	nations@d	oerun.com)
Common Paran	neter/Cont	ainer – Pr	reservation	on Key	Relinquisbed Stephen Moil	^ <i>iyi Mili</i> i	2			On Io	ce?	3.	ate:	13	r	ime	υŪ	7	Rec	eive	i b/:	2			F	3	~~	Date: 2/13/2	Time:	10:35
-	#1 - Volatile Organics = BTEX, GRO, TPH, 8260 Full List #2 - Semivolatile Organics = PAHs, PCP, Dioxins, 8270						On 10	ce?	D	ate;		, т	ime	25		Rec	eive	d by	Z		1			Ć	Dette: 13.13					
Full List, Herbic	de/Pesticid	e, PCBs			Samples Sh	ipped VIA: [Air	Freight		١		∐. Sa	/-/ <u>/</u> mple	70		DI	22	-	Air	Bįll	Nun	ıber	<u>-</u>					41517	100	<u> </u>
#3 – General = p TDS, TS, Sulfate						ŧ	X Oth	er:	OUT	(W.J			_							ge ge	مراد		/ /	1. /	3.	13				
#4 - Nutrients = TKN	COD, TOC,	Phenols,	Ammonia	Nitrogen,	Distribution	n: White Or	igina	l Accom	npanies	Shir	pment t	to L	ab; \	rello	w –	Fiel	d Co	opy:	Pink			oord		_	2	<u>/_</u>				 -

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample	Lab	Sample Name	Pb	Zn	Cu	Cd	Ni	Tl	Fe	Alka	S04	pН	Turbidity
Date	Number		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	FAU
2/1/13	13-0678	RMP ROUGH T	3.3	8182^	2.6	0.19 J	674	22	1158	194	791	7.22	0
		RMP ROUGH D		7913^		23.	1.		1063				-0

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34



SEMO PROJECT: RiverminesANALYSIS METHOD: EPA 200.7
ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L13-0001-0678

	Units	Blank Result	RL_	Analyzed	Qualifiers
Cadmium	ug/L	ND	0.38	2/5/13	
Copper	ug/L	ND	0.97	2/5/13	
Lead	ug/L	0.28	2.7	2/5/13	
Zinc	ug/L	ND	0.91	2/5/13	
Nickel	ug/L	0.17	0.86	2/5/13	
Thallium	ug/L	ND	1.86	2/5/13	
Iron	ug/L	ND	2.0	2/5/13	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits Qualifiers
Cadmium	ug/L	500	481	96%	85-115%
Copper	ug/L	500	500	100%	85-115%
Lead	ug/L	500	487	97%	85-115%
Zinc	ug/L	500	477	95%	85-115%
Nickel	ug/L	500	489	98%	85-115%
Iron	ug/L	500	479	96%	85-115%

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 13-0678 1/100 dil

Parameter	_Units_	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0	500	500	546	544	109%	109%	75-125%	
Copper	ug/L	0	500	500	497	498	99%	100%	75-125%	
Lead	ug/L	0.03	500	500	497	496	99%	99%	75-125%	
Zinc	ug/L	82	500	500	647	644	113%	112%	75-125%	
Nickel	ug/L	8.6	500	500	504	500	99%	98%	75-125%	
Iron	119/1.	4.1	500	500	482	486	96%	96%	75-125%	



Slope

99.5%

Quentin J. Schmidt Analytical Laboratory 43 Iron County Road No 1 Bldg 3 Viburnum, MO 65566 (573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

ALVAL I SIS DES	SIGH 11014, 2320.	D Aikaninty				
METHOD BLAN	K					
Associated Lab Sa	imples: L13-0001	-0678				
			Reporting			
Parameter	Units	Blank Result	Limit	Ana	lyzed	Qualifiers
Alkalinity	mg/L	0.54	5	2/6	5/13	
LABORATORY	CONTROL SAM	PLE				
_				LCS	% Rec	
Parameter	Units	Spike Conc.	LCS Results	% Rec	Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	103.6	104%	85-115%	
LABORATORY	CONTROL SAMI	PLE DUPLICATE				
~	** *.	0 11 0	1 CC D 1:	LCS	% Rec	0 110
Parameter	Units	Spike Conc	LCS Results	% Rec	Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	104.7	105%	85-115%	
LABORATORY	SAMPLE DUPLI	CATE 13-0678	<u></u>	-		
				LCS	% Rec	
Parameter	Units	Results	Results Dup	% Rec	Limits	Qualifiers
Alkalinity	mg/L CaCO3	193.7	194.2	100%	85-115%	
pH SM4500-H+E	Results		QC Limits	Lab Stan	dard Number	
ICV Buffer 7.00	7.01		6,95-7.05	L11-000	2-0121	
ICV Buffer 4.00	4.05		3.95-4.05	L12-000	2-0046	
ICV Buffer 10.01	9.96		9.96-10.06	L12-000		
CCV Buffer 10.00	9.97		9.96-10.06	L11-000		
			3.95-4.05	L12-000		
CCV Buffer 4.05	4.05		3.93~4.03	L12-000.	2-0048	

90-102%



QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

METHOD BL.	ANK	MATRIX:Wate	r				
Associated Lab	Samples: I	L13-0001-0678					
		Blank	Reporting				
Parameter	Units	Result	Limit	Ana	lyzed	Qualifiers	•
Sulfate	mg/l	ND	0.63	2/	1/13		
MATRIX SI	PIKE SAN	MPLE					
SAMPLE N	UMBER /	/ NAME:					
			MS Spike	MS	MS	Rec	
Parameter	Units	Results_	Conc	Results	% Rec	Limits	Qual
Sulfate 13-067	8 mg/l	7.9	4	11.3	85%	75-125	
LABORATOR	Y CONTR	OL SAMPLE	<u></u>		-		
		Spike		LCS	% Rec		
Parameter	Units	Conc.	LCS Results	% Rec	Limits	Qualifiers	
Sulfate	mg/l	5	4.4	88%	85-115		



QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed								
ND	Not detected/ below Method Detection Limit.								
В	Potential false positive value based upon blank sample data validation procedures.								
Е	Estimated value, exceeded the instrument calibration range.								
	Recommended sample preservation, extraction or analysis holding time was								
G	exceeded.								
J	Lower than reporting limit and higher than MDL and is an estimated value.								
	Per client request, metals analysis was conducted less than 16 hours from								
K	sample collection/preservation.								
*	Estimated value, QA/QC criteria not met.								
**	Unusable value, QA/QC criteria not met.								
***	Dissolved result > than associated Total result.								
۸	1/100 Dilution								
-	Filtered Samples prepared in the field.								

ANALYTE QUALIFIERS

- H Analysis conducted outside the EPA method holding time.
- Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	AMM
IC	TLL

Report Acceptance					
QAO	Date				
GWP	2/6/2013				
Manager	Date				
EJS	2/6/2013				

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

			_		NAME OF TAXABLE PARTY.	-	-	-					The real Property lies, the last of
Sample	Lab	Sample Name	Pb	Zn	Cu	Cd	Ni	Tl	Fe	Alka	S04	pН	Turbidity
Date	Number	•	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	FAU
2/4/13	13-0706	RMP ROUGH T	3.3	8687^	5.4	ND	713	25	1301	191	789	7.07	0
		RMP ROUGH D		8029^					1208				

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34



SEMO PROJECT: Rivermines

EPA 200.7 ANALYSIS METHOD: ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L13-0001-0706

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	ND	0.38	2/5/13	
Copper	ug/L	0.59	0.97	2/5/13	
Lead	ug/L	0.18	2.7	2/5/13	
Zinc	ug/L	ND	0.91	2/5/13	
Nickel	ug/L	ND	0.86	2/5/13	
Thallium	ug/L	0.46	1.86	2/5/13	
Iron	ug/L	4.9	2.0	2/5/13	

LABORATORY CONTROL SAMPLE, TOTAL							
Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers	
Cadmium	ug/L	500	502	100%	85-115%		
Copper	ug/L	500	500	100%	85-115%		
Lead	ug/L	500	500	100%	85-115%		
Zinc	ug/L	500	503	101%	85-115%		
Nickel	ug/L	500	501	100%	85-115%		
Iron	ug/L	500	512	102%	85-115%		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 13-0706 1/100 dil

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0	500	500	555	546	111%	109%	75-125%	
Copper	ug/L	2.8	500	500	497	488	99%	97%	75-125%	
Lead	ug/L	0.78	500	500	501	496	100%	99%	75-125%	
Zinc	ug/L	87	500	500	659	649	114%	112%	75-125%	
Nickel	ug/L	8.8	500	500	507	500	100%	98%	75-125%	
Iron	ug/L	8.8	500	500	510	526	100%	103%	75-125%	



Slope

99.5%

Quentin J. Schmidt Analytical Laboratory 43 Iron County Road No 1 Bldg 3 Viburnum, MO 65566 (573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

ANALYSIS DESC	CRIPTION: 2320	B Alkalinity				
METHOD BLAN	K					
Associated Lab Sa	mples: L13-0001	-0706				
			Reporting			
Parameter	Units	Blank Result	Limit	Ana	lyzed	Qualifiers
Alkalinity	mg/L	0.54	5	2/6	5/13	
LABORATORY (CONTROL SAMI	PLE				
	_			LCS	% Rec	
Parameter	Units	Spike Conc.	LCS Results	% Rec	Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	103.6	104%	85-115% 	
LABORATORY (CONTROL SAME	PLE DUPLICATE	,	1.00	0/ D	
D	***	G 11- G-	I 00 D l	LCS % Rec	% Rec	0 156
Parameter	Units	Spike Conc	LCS Results		Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	104.7	105%	85-115%	
LABORATORY	SAMPLE DUPLI	CATE 13-0706				
				LCS	% Rec	
Parameter	Units	Results	Results Dup	% Rec	Limits	Qualifiers
Alkalinity	mg/L CaCO3	190.9	190.9	100%	85-115%	
pH SM4500-H+I	Results		QC Limits	Lab Stan	dard Number	
10110 65 700	7.01		6.05.7.05	7.11.000	2.0101	
ICV Buffer 7.00	7.01		6.95-7.05	L11-000		
ICV Buffer 4.00	4.05		3.95-4.05	L12-0002		
ICV Buffer 10.01	9.96		9.96-10.06	L12-0002	2-0047	
CCV Buffer 10.00	9.97		9.96-10.06	L11-0002	2-0122	
CCV Buffer 4.05	4.05		3.95-4.05	L12-0002	2-0048	

90-102%



Sulfate

Quentin J. Schmidt Analytical Laboratory 43 Iron County Road No 1 Bldg 3 Viburnum, MO 65566 (573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

mg/l

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

5

4.9

METHOD BL.	ANK	MATRIX:Wate	er				
Associated Lab	Samples: 1	L13-0001-0706					
Parameter	Units	Blank Result	Reporting Limit	Ana	lyzed	Qualifiers	
Sulfate	mg/l	ND	0.63	2/4	1/13		
MATRIX SI	PIKE SAN	MPLE					
SAMPLE N	UMBER.	/ NAME:					
Parameter	Units	Results	MS Spike Conc	MS Results	MS % Rec	Rec Limits Qual	
Sulfate 13-070	6 mg/l	7.9	4	11.5	90%	75-125	
LABORATOR	Y CONTR	OL SAMPLE			=	· · · · · · · · · · · · · · · · · · ·	- <u>-</u> -
Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers	

98% 85-115



QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
В	Potential false positive value based upon blank sample data validation procedures.
E	Estimated value, exceeded the instrument calibration range.
	Recommended sample preservation, extraction or analysis holding time was
G	exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
	Per client request, metals analysis was conducted less than 16 hours from
K	sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
۸	1/100 Dilution
	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

- H Analysis conducted outside the EPA method holding time.
- M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- RPD value was outside control limits.

NES Not enough sample.

Method	Analysts				
200.7	TLL				
Alka	AMM				
IC	TLL				

Report Acceptance					
QAO Date					
GWP	2/6/2013				
Manager	Date				
EJS	2/6/2013				

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample	Lab	Sample Name	Pb	Zn	Cu	Cd	Ni	Tl	Fe	Alka	S04	pН	Turbidity
Date	Number		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	FAU
2/11/13	13-0839	RMP ROUGH T	3.6	12210^	3.3	ND	1061	23	1467	159	788	7.11	6
		RMP ROUGH D		11380^				4.7	1468***	是是理			

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34



SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7 ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L13-0001-0839

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	ND	0.38	2/13/13	
Copper	ug/L	1.7	0.97	2/13/13	
Lead	ug/L	ND	2.7	2/13/13	
Zinc	ug/L	0.16	0.91	2/13/13	
Nickel	ug/L	ND	0.86	2/13/13	
Thallium	ug/L	0.09	1.86	2/13/13	
Iron	ug/L	ND	2.0	2/13/13	

LABORATORY CON	ITROL SA	AMPLE, TOTA	AL		
Parameter	Units	Spike Conc.	LCS Results	Rec	Limits Qualifiers
Cadmium	ug/L	500	494	99%	85-115%
Copper	ug/L	500	512	102%	85-115%
Lead	ug/L	500	493	99%	85-115%
Zinc	ug/L	500	501	100%	85-115%
Nickel	ug/L	500	491	98%	85-115%
Iron	ug/L	500	466	93%	85-115%

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 13-0839 1/100 dil

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0	500	500	586	568	117%	114%	75-125%	-
Copper	ug/L	0	500	500	466	445	93%	89%	75-125%	
Lead	ug/L	0.38	500	500	514	497	103%	99%	75-125%	
Zinc	ug/L	122	500	500	740	713	124%	118%	75-125%	
Nickel	ug/L	14	500	500	518	499	101%	97%	75-125%	
Iron	ug/L	14	500	500	566	547	110%	107%	75-125%	



(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

METHOD BEAN	IX.					
Associated Lab Sa	amples: L13-0001	-0839				
Parameter	Units	Blank Result	Reporting Limit	Ana	lyzed	Qualifiers
Alkalinity	mg/L	0.4	5	2/1	3/13	
LABORATORY	CONTROL SAM	PLE				
Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	93.8	94%	85-115%	
LABORATORY	CONTROL SAMI	PLE DUPLICATE	}			
Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	96.3	96%	85-115%	
LABORATORY	SAMPLE DUPLI	CATE 13-0839		-		
Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	158.5	159	100%	85-115%	
pH SM4500-H+F	Results		QC Limits	Lab Stan	dard Number	
ICV Buffer 7.00	6.96		6.95-7.05	L11-000	2-0121	
ICV Buffer 4.00	3.99		3.95-4.05	L12-000	2-0046	
ICV Buffer 10.01	9.98		9.96-10.06	L12-000	2-0047	
CCV Buffer 10.00	10.05		9.96-10.06	L11-000	2-0122	
CCV Buffer 4.05	4		3.95-4.05	L12-000	2-0048	
Slope	93.4%		90-102%			



QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

METHOD BL		MATRIX:Wate	r				
Associated Lai	b Samples: I	L13-0001-0839	Donoutino				
Parameter	Units	Blank Result	Reporting Limit	Ana	lyzed	Qualifiers	
Sulfate	mg/l	ND	0.63	2/1	1/12		
MATRIX SI	PIKE SAN	MPLE	/	<u>-</u>			
SAMPLE N	UMBER A	NAME:					
			MS Spike	MS	MS	Rec	
Parameter	Units	Results	Conc	Results	% Rec	Limits	Qual
Sulfate 13-083	9 mg/l	7.8	4	11.3	88%	75-125	-
LABORATOR	Y CONTR	OL SAMPLE					
		Spike		LCS	% Rec		
Parameter	Units	Conc.	LCS Results	% Rec	Limits	Qualifiers	
Sulfate	mg/l	5	4.3	86%	85-115		



QUALIFIERS

SEMO PROJECT

DEFINITIONS

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ANALYTE QUALIFIERS

- H Analysis conducted outside the EPA method holding time.
- Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	AMM
IC	TLL

Report Acceptance					
QAO	Date				
GWP	2/18/2013				
Manager	Date				
EJS	2/18/2013				

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample	Lab	Sample Name	Pb	Zn	Cu	Cd	Ni	Tl	Fe	Alka	S04	рН	Turbidity
Date	Number	•	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	FAU
2/13/13	13-0929	RMP ROUGH T	2.8	10680^	1.6	ND	816	25	1520	159	752	7.03	6
		RMP ROUGH D		10930^***					1414				

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34



SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7

ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L13-0001-0929

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	0.02	0.38	2/14/13	
Copper	ug/L	1.0	0.97	2/14/13	
Lead	ug/L	ND	2.7	2/14/13	
Zinc	ug/L	0.14	0.91	2/14/13	
Nickel	ug/L	ND	0.86	2/14/13	
Thallium	ug/L	ND	1.86	2/14/13	
Iron	ug/L	ND	2.0	2/14/13	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits Qualifiers
Cadmium	ug/L	500	521	104%	85-115%
Copper	ug/L	500	509	102%	85-115%
Lead	ug/L	500	522	104%	85-115%
Zinc	ug/L	500	520	104%	85-115%
Nickel	ug/L	500	520	104%	85-115%
Iron	ug/L	500	514	103%	85-115%

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 13-0929 1/100 dil

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0	500	500	581	565	116%	113%	75-125%	•
Copper	ug/L	0.83	500	500	440	424	88%	85%	75-125%	
Lead	ug/L	0	500	500	516	503	103%	101%	75-125%	
Zinc	ug/L	107	500	500	711	692	121%	117%	75-125%	
Nickel	ug/L	10	500	500	521	508	102%	100%	75-125%	
Iron	ug/L	5.2	500	500	521	498	103%	99%	75-125%	



QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

METHOD BLAN	N.					
Associated Lab Sa	amples: L13-0001	-0929				
			Reporting			
Parameter	Units	Blank Result	Limit	Ana	lyzed	Qualifiers
Alkalinity	mg/L	0.4	5	2/1	3/13	
LABORATORY	CONTROL SAMI	PLE				
				LCS	% Rec	
Parameter	Units	Spike Conc.	LCS Results	% Rec	Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	93.8	94%	85-115%	
LABORATORY	CONTROL SAME	LE DUPLICATE			o' D	
		^ '' ^	I CO D	LCS	% Rec	0 110
Parameter	Units	Spike Conc	LCS Results	% Rec	Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	96.3	96%	85-115%	
LABORATORY	SAMPLE DUPLI	CATE 13-0929	***			
				LCS	% Rec	
LABORATORY Parameter	SAMPLE DUPLI Units	CATE 13-0929 Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
						Qualifiers
Parameter	Units mg/L CaCO3	Results	Results Dup	% Rec 105%	Limits	Qualifiers
Parameter Alkalinity pH SM4500-H+F	Units mg/L CaCO3 Results	Results	Results Dup 167 QC Limits	% Rec 105% Lab Stan	Limits 85-115% dard Number	Qualifiers
Parameter Alkalinity pH SM4500-H+F ICV Buffer 7.00	Units mg/L CaCO3 Results 6.96	Results	Results Dup 167 QC Limits 6.95-7.05	% Rec 105% Lab Stan L11-000	Limits 85-115% dard Number 2-0121	Qualifiers
Parameter Alkalinity pH SM4500-H+F ICV Buffer 7.00 ICV Buffer 4.00	Units mg/L CaCO3 Results 6.96 3.99	Results	Results Dup 167 QC Limits 6.95-7.05 3.95-4.05	% Rec 105% Lab Stan L11-000; L12-000;	Limits 85-115% dard Number 2-0121 2-0046	Qualifiers
Parameter Alkalinity pH SM4500-H+F ICV Buffer 7.00	Units mg/L CaCO3 Results 6.96	Results	Results Dup 167 QC Limits 6.95-7.05	% Rec 105% Lab Stan L11-000	Limits 85-115% dard Number 2-0121 2-0046	Qualifiers
Parameter Alkalinity pH SM4500-H+F ICV Buffer 7.00 ICV Buffer 4.00	Units mg/L CaCO3 Results 6.96 3.99	Results	Results Dup 167 QC Limits 6.95-7.05 3.95-4.05	% Rec 105% Lab Stan L11-000; L12-000;	Limits 85-115% dard Number 2-0121 2-0046 2-0047	Qualifiers
Parameter Alkalinity pH SM4500-H+F ICV Buffer 7.00 ICV Buffer 4.00 ICV Buffer 10.01	Units mg/L CaCO3 Results 6.96 3.99 9.98	Results	Results Dup 167 QC Limits 6.95-7.05 3.95-4.05 9.96-10.06	% Rec 105% Lab Stan L11-000; L12-000; L12-000;	Limits 85-115% dard Number 2-0121 2-0046 2-0047 2-0122	Qualifiers



QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

METHOD BL	ANK	MATRIX: Water	•				
Associated Lat	Samples: 1	L13-0001-0929					
Parameter	Units	Blank Result	Reporting Limit	Ana	lyzed	Qualifiers	
Sulfate	mg/l	ND	0.63	2/1	5/13		
MATRIX SI	PIKE SAI	MPLE	 ,		· · · · · · · · · · · · · · · · · · ·		
SAMPLE N	UMBER .	/ NAME:	•				
			MS Spike	MS	MS	Rec	
Parameter	Units	Results	Conc	Results	% Rec	Limits	Qual
Sulfate 13-092	9 mg/l	7.52	4	11.6	102%	75-125	
LABORATOR	Y CONTR	OL SAMPLE					
		Spike		LCS	% Rec		
Parameter	Units	Conc.	LCS Results	% Rec	Limits	Qualifiers	
Sulfate	mg/l	5	4.8	96%	85-115	 -	



QUALIFIERS

SEMO PROJECT

DEFINITIONS

110/10								
NA	Not Analyzed							
ND	Not detected/ below Method Detection Limit.							
В	Potential false positive value based upon blank sample data validation procedures.							
Е	Estimated value, exceeded the instrument calibration range.							
	Recommended sample preservation, extraction or analysis holding time was							
G	exceeded.							
J	Lower than reporting limit and higher than MDL and is an estimated value.							
	Per client request, metals analysis was conducted less than 16 hours from							
K	sample collection/preservation.							
*	Estimated value, QA/QC criteria not met.							
**	Unusable value, QA/QC criteria not met.							
***	Dissolved result > than associated Total result.							
۸	1/100 Dilution							
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Filtered Samples prepared in the field.							

ANALYTE QUALIFIERS

- H Analysis conducted outside the EPA method holding time.
- Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	AMM
IC	TLL

Report Acceptance					
QAO	Date				
GWP	2/22/2013				
Manager	Date				
EJS	2/22/2013				

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample	Lab	Sample Name	Pb	Zn	Cu	Cd	Ni	Tl	Fe	Alka	S04	pН	Turbidity
Date	Number		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	FAU
2/15/13	13-0956	RMP ROUGH T	ND	10820^	3.4	0.15J	814	28	1451	143	808	7.36	0
		RMP ROUGH D		11420^***					1433				

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34



SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7 ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L13-0001-0956

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	0.03	0.38	2/15/13	
Copper	ug/L	2.7	0.97	2/15/13	
Lead	ug/L	ND	2.7	2/15/13	
Zinc	ug/L	ND	0.91	2/15/13	
Nickel	ug/L	ND	0.86	2/15/13	
Thallium	ug/L	1.8	1.86	2/15/13	
Iron	ug/L	8.6	2.0	2/15/13	

LABORATORY CO	NTROL S	AMPLE, TOT	AL			
Parameter	Units	Spike Conc.	LCS Results	Rec	Limits Qualifiers	_
Cadmium	ug/L	500	520	104%	85-115%	
Copper	ug/L	500	519	104%	85-115%	
Lead	ug/L	500	520	104%	85-115%	
Zinc	ug/L	500	521	104%	85-115%	
Nickel	ug/L	500	519	104%	85-115%	
Iron	ug/L	500	522	104%	85-115%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 13-0956 1/100 dil

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0	500	500	584	589	117%	118%	75-125%	
Copper	ug/L	0	500	500	465	463	93%	93%	75-125%	
Lead	ug/L	0	500	500	523	525	105%	105%	75-125%	
Zinc	ug/L	108	500	500	721	726	123%	124%	75-125%	
Nickel	ug/L	10	500	500	531	531	104%	104%	75-125%	
Iron	110/I .	4.7	500	500	597	550	118%	109%	75-125%	



(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

Associated Lab Sa	mples: L13-0001	-0956				
Parameter Alkalinity	Units mg/L	Blank Result	Reporting Limit 5		lyzed	Qualifiers
Timumity		2.20	<u>.</u>		1, 10	
LABORATORY	CONTROL SAMI	PLE				
Parameter	Units	Spike Conc.	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	104.1	104%	85-115%	
LABORATORY (CONTROL SAMI	LE DUPLICATE		 		
Parameter	Units	Spike Conc	LCS Results	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	102.6	103%	85-115%	
LABORATORY	SAMPLE DUPLI	CATE 13-0956				
Parameter	Units	Results	Results Dup	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity	mg/L CaCO3	142.8	144.8	101%	85-115%	
pH SM4500-H+I	Results		QC Limits	Lab Stan	dard Number	
ICV Buffer 7.00	7.00		6.95-7.05	L11-000	2-0121	
ICV Buffer 4.00	3.97		3.95-4.05	L12-000	2-0046	
ICV Buffer 10.01	9.96		9.96-10.06	L12-000	2-0047	
CCV Buffer 10.00	9.97		9.96-10.06	L11-000	2-0122	
CCV Buffer 4.05	3.95		3.95-4.05	L12-000	2-0048	
Slope	97.2%		90-102%			



QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

METHOD BL	ANK	MATRIX:Water	·	 -			
Associated Lat	Samples: I	.13-0001-0956					
.	** *.	Blank	Reporting			0 110	
Parameter	Units	Result	Limit	Ana	lyzed	Qualifiers	
Sulfate	mg/l	ND	0.63	2/15/13			·
MATRIX SI	PIKE SAN	MPLE				<u> </u>	
SAMPLE N	UMBER A	'NAME:					
			MS Spike	MS	MS	Rec	
Parameter	Units	Results	Conc	Results	% Rec	Limits	Qual
Sulfate 13-095	6 mg/l	8.1	4	11.3	80%	75-125	
LABORATOR	Y CONTRO	OL SAMPLE					
		Spike		LCS	% Rec		
Parameter	Units	Conc.	LCS Results	% Rec	Limits	Qualifiers	
Sulfate	mg/l	4	4.2	105%	85-115		



QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
В	Potential false positive value based upon blank sample data validation procedures.
Е	Estimated value, exceeded the instrument calibration range.
	Recommended sample preservation, extraction or analysis holding time was
G	exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
	Per client request, metals analysis was conducted less than 16 hours from
K	sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
۸	1/100 Dilution
() ()	Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

- H Analysis conducted outside the EPA method holding time.
- Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	AMM
IC	TLL

Report A	Report Acceptance							
QAO	Date							
GWP	2/22/2013							
Manager	Date							
EJS	2/22/2013							

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample	Lab	Sample Name	Pb	Zn	Cu	Cd	Ni	Tl	Fe	Alka	S04	pН	Turbidity
Date	Number	•	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	FAU
2/18/13	13-0987	RMP ROUGH T	3.3	8959^	1.8	ND	824	27	1326	164	786	7.15	8
		RMP ROUGH D		8457^					1263				

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34



SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7 ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L13-0001-0987

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	ND	0.38	2/20/13	
Copper	ug/L	ND	0.97	2/20/13	
Lead	ug/L	0.08	2.7	2/20/13	
Zinc	ug/L	0.99	0.91	2/20/13	
Nickel	ug/L	ND	0.86	2/20/13	
Thallium	ug/L	ND	1.86	2/20/13	
Iron	ug/L	ND	2.0	2/20/13	
Nickel Thallium	ug/L ug/L	ND ND	0.86 1.86	2/20/13 2/20/13	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers
Cadmium	ug/L	500	495	99%	85-115%	
Copper	ug/L	500	487	97%	85-115%	
Lead	ug/L	500	490	98%	85-115%	
Zinc	ug/L	500	492	98%	85-115%	
Nickel	ug/L	500	488	98%	85-115%	
Iron	ug/L	500	480	96%	85-115%	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 13-0987 1/100 dil

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0.04	500	500	478	482	96%	96%	75-125%	
Copper	ug/L	0	500	500	484	491	97%	98%	75-125%	
Lead	ug/L	0.57	500	500	479	482	96%	96%	75-125%	
Zinc	ug/L	90	500	500	562	606	94%	103%	75-125%	
Nickel	ug/L	9.4	500	500	473	476	93%	93%	75-125%	
Iron	ug/L	0	500	500	420	433	84%	87%	75-125%	



QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DE	SCRIPTION: 2320		7.15			
METHOD BLA	NK					
Associated Lab S	Samples: L13-0001	-0987				
Parameter	Units	Blank Result	Limit		lyzed	Qualifiers
Alkalinity	mg/L	2.28	5	2/2	1/13	
LABORATORY	CONTROL SAMI	PLE				
.	T.T. *.	0.11.0	1 CO D 1	LCS	% Rec	0 117
Parameter	Units	Spike Conc.	LCS Results	% Rec	Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	104.1	104%	85-115%	
LABORATORY	CONTROL SAMI	PLE DUPLICATE	;			
				LCS	% Rec	
Parameter	Units	Spike Conc	LCS Results	% Rec	Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	102.6	103%	85-115%	
LABORATORY	SAMPLE DUPLI	CATE 13-0987				
				LCS	% Rec	
Parameter	Units	Results	Results Dup	% Rec	Limits	Qualifiers
Alkalinity	mg/L CaCO3	163.6	165.1	101%	85-115%	
pH SM4500-H+	F Results		QC Limits	Lab Stan	dard Number	
ICV Buffer 7.00	7.00		6.95-7.05	L11-000	2-0121	
ICV Buffer 4.00	3.97		3.95-4.05	L12-000	2-0046	
ICV Buffer 10.01	9.96		9.96-10.06	L12-000	2-0047	
CCV Buffer 10.0	9.97		9.96-10.06	L11-0002	2-0122	
CCV Buffer 4.05	3.95		3.95-4.05	L12-0002	2-0048	
Slope	97.2%		90-102%			



QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0 7.15

METHOD BL.		MATRIX:Water L13-0001-0987					
Parameter	Units	Blank Result	Reporting Limit	Ana	lyzed	Qualifiers	
Sulfate	mg/l	ND	0.63	2/2	0-13		
MATRIX SI SAMPLE N			MS Spike	MS	MS	Rec	
Parameter	Units	Results	Conc	Results	% Rec	Limits	Qual
Sulfate 13-098	7 mg/l	7.9	4	11.8	98%	75-125	
LABORATOR	Y CONTR	OL SAMPLE					
		Spike		LCS	% Rec		
Parameter	Units	Conc.	LCS Results	% Rec	Limits	Qualifiers	
Sulfate	mg/l	4	4.1	103%	85-115		



QUALIFIERS

SEMO PROJECT

DEFINITIONS

NA	Not Analyzed							
ND	Not detected/ below Method Detection Limit.							
В	Potential false positive value based upon blank sample data validation procedures.							
Е	Estimated value, exceeded the instrument calibration range.							
	Recommended sample preservation, extraction or analysis holding time was							
G	exceeded.							
J	Lower than reporting limit and higher than MDL and is an estimated value.							
	Per client request, metals analysis was conducted less than 16 hours from							
K	sample collection/preservation.							
*	Estimated value, QA/QC criteria not met.							
**	Unusable value, QA/QC criteria not met.							
***	Dissolved result > than associated Total result.							
۸	1/100 Dilution							
	Filtered Samples prepared in the field.							

ANALYTE QUALIFIERS

- H Analysis conducted outside the EPA method holding time.
- Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- RPD value was outside control limits.

NES Not enough sample.

Method	Analysts				
200.7	TLL				
Alka	AMM				
IC	TLL				

Report Acceptance						
QAO	Date					
GWP	2/22/2013					
Manager	Date					
EJS	2/22/2013					

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample	Lab	Sample Name	Pb	Zn	Cu	Cd	Ni	Tl	Fe	Alka	S04	pН	Turbidity
Date	Number		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	FAU
2/20/13	13-1088	RMP ROUGH T	2.8	11490^	1.0	ND	818	23	1202	171	821	7.4	0
		RMP ROUGH D		11100^					1068				

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34



(573) 244-8105

SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7 ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L13-0001-1088

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	0.10	0.38	2/21/13	
Copper	ug/L	ND	0.97	2/21/13	
Lead	ug/L	ND	2.7	2/21/13	
Zinc	ug/L	0.27	0.91	2/21/13	
Nickel	ug/L	0.11	0.86	2/21/13	
Thallium	ug/L	0.42	1.86	2/21/13	
Iron	ug/L	ND	2.0	2/21/13	

LABORATORY CONTROL SAMPLE, TOTAL											
Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers					
Cadmium	ug/L	500	502	100%	85-115%						
Copper	ug/L	500	506	101%	85-115%						
Lead	ug/L	500	501	100%	85-115%						
Zinc	ug/L	500	503	101%	85-115%						
Nickel	ug/L	500	504	101%	85-115%						
Iron	110/[.	500	489	98%	85-115%						

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 13-1088 1/100 dil

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0	500	500	566	557	113%	111%	75-125%	
Copper	ug/L	0	500	500	432	423	86%	85%	75-125%	
Lead	ug/L	0	500	500	509	500	102%	100%	75-125%	
Zinc	ug/L	115	500	500	693	683	116%	114%	75-125%	
Nickel	ug/L	11	500	500	502	497	98%	97%	75-125%	
Iron	ug/L	1.2	500	500	451	455	90%	91%	75-125%	



CCV Buffer 10.00

CCV Buffer 4.05

Slope

9.97

3.95

97.2%

Quentin J. Schmidt Analytical Laboratory 43 Iron County Road No 1 Bldg 3 Viburnum, MO 65566 (573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B
ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLAN	NK					
Associated Lab S	Samples: L13-0001	-1088				
			Reporting			
Parameter	Units	Blank Result	Limit	Ana	lyzed	Qualifiers
Alkalinity	mg/L	2.28	5	2/2	1/13	
LABORATORY	CONTROL SAM	PLE				
				LCS	% Rec	
Parameter	Units	Spike Conc.	LCS Results	% Rec	Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	104.1	104%	85-115%	
LABORATORY	CONTROL SAM	PLE DUPLICATE	3			
				LCS	% Rec	
Parameter	Units	Spike Conc	LCS Results	% Rec	Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	102.6	103%	85-115%	
LABORATORY	SAMPLE DUPLI	CATE 13-1088				
				LCS	% Rec	
Parameter	Units	Results	Results Dup	% Rec	Limits	Qualifiers
Alkalinity	mg/L CaCO3	170.6	169.6	99%	85-115%	
pH SM4500-H+	F Results		QC Limits	Lab Stan	dard Number	· · · · · ·
ICV Buffer 7.00	7.00		6.95-7.05	L11-000	2-0121	
ICV Buffer 4.00	3.97		3.95-4.05	L12-000	2-0046	
ICV Buffer 10.01	9.96		9.96-10.06	L12-000	2-0047	

9.96-10.06

3.95-4.05

90-102%

L11-0002-0122

L12-0002-0048



QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

METHOD BL.	ANK	MATRIX:Wate	r				
Associated Lat	Samples: L	13-0001-1088					
Parameter	Units	Blank Result	Reporting Limit	Ana	lyzed	Qualifiers	
Sulfate	mg/l	ND	0.63		2/20/13		
MATRIX SI	PIKE SAN	1PLE			····		
SAMPLE N	UMBER /	NAME:					
			MS Spike	MS	MS	Rec	
Parameter	Units	Results	Conc	Results	% Rec	Limits	Qual
Sulfate 13-108	8 mg/l	8.2	1.5	9.4	80%	75-125	
LABORATOR	Y CONTRO	OL SAMPLE	· · ·	*	· · · · · ·		
		Spike		LCS	% Rec		
Parameter	Units	Conc.	LCS Results	% Rec	Limits	Qualifiers	
Sulfate	mg/l	5	4.4	88%	85-115		



SEMO PROJECT

DEFINITIONS

NA	Not Analyzed
ND	Not detected/ below Method Detection Limit.
В	Potential false positive value based upon blank sample data validation procedures.
Е	Estimated value, exceeded the instrument calibration range.
	Recommended sample preservation, extraction or analysis holding time was
G	exceeded.
J	Lower than reporting limit and higher than MDL and is an estimated value.
	Per client request, metals analysis was conducted less than 16 hours from
K	sample collection/preservation.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
***	Dissolved result > than associated Total result.
^	1/100 Dilution
	Filtered Samples prepared in the field.

QUALIFIERS

ANALYTE QUALIFIERS

- H Analysis conducted outside the EPA method holding time.
- M Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	AMM
IC	TLL

Report Acceptance					
QAO	Date				
GWP	2/22/2013				
Manager	Date				
EJS	2/22/2013				

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample	Lab	Sample Name	Pb	Zn	Cu	Cd	Ni	Tl	Fe	Alka	S04	P	TSS	pН	Turbidity
Date	Number	•	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	FAU
2/25/13	13-1139	RMP ROUGH T	2.2 J	8097^	ND	ND	859	27	2215	176	774			6.98	7
		RMP ROUGH D		8221^***					1977						
2/25/13	13-1140	RMP POLISH T	2.7	5662^	ND	0.26 J	670	26	85	168	789		ND	7.25	8
		RMP POLISH D		5957^***					40	District Control	建筑		*		
2/25/13	13-1141	RMP EFFLUENT T	12	6632^	4.6	3.7	495	26	412	178		0.06	9.00	7.46	8
		RMP EFFLUENT D		6550^			577747		32		3		4		

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34



SEMO PROJECT: RiverminesANALYSIS METHOD: EPA 200.7
ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L13-0001-1139,L13-0001-1140,L13-0001-1141

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	0.03	0.38	2/26/13	
Copper	ug/L	ND	0.97	2/26/13	
Lead	ug/L	ND	2.7	2/26/13	
Zinc	ug/L	0.24	0.91	2/26/13	
Nickel	ug/L	ND	0.86	2/26/13	
Thallium	ug/L	0.38	1.86	2/26/13	
Iron	ug/L	ND	2.0	2/26/13	

LABORATORY CONTROL SAMPLE, TOTAL										
Parameter	Units	Spike Conc.	LCS Results	Rec	Limits	Qualifiers				
Cadmium	ug/L	500	497	99%	85-115%					
Copper	ug/L	500	475	95%	85-115%					
Lead	ug/L	500	495	99%	85-115%					
Zinc	ug/L	500	501	100%	85-115%					
Nickel	ug/L	500	500	100%	85-115%					
Iron	ng/L	500	510	102%	85-115%					

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 13-1139 1/100 dil

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0.13	500	500	468	474	94%	95%	75-125%	
Copper	ug/L	0	500	500	478	475	96%	95%	75-125%	
Lead	ug/L	0.03	500	500	475	479	95%	96%	75-125%	
Zinc	ug/L	81	500	500	555	565	95%	97%	75-125%	
Nickel	ug/L	10	500	500	489	500	96%	98%	75-125%	
Iron	ug/L	4.2	500	500	508	497	101%	99%	75-125%	



QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD BLANK

METHOD DUTIN						
Associated Lab Sa	amples: L13-0001	-1139,L13-0001-1	140,L13-0001-1	141		
		•	Reporting			
Parameter	Units	Blank Result	Limit	Analyzed		Qualifiers
Alkalinity	mg/L	0.5	5	2/2	7/13	
LABORATORY	CONTROL SAM	PLE		<u> </u>	<u> </u>	
				LCS	% Rec	
Parameter	Units	Spike Conc.	LCS Results	% Rec	Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	100.6	101%	85-115%	
LABORATORY	CONTROL SAMI	PLE DUPLICATE	3		04.70	
ъ.	** **	0.11.0	I CC D	LCS	% Rec	0 110
Parameter	Units	Spike Conc	LCS Results	% Rec	Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	101.6	102%	85-115%	
LABORATORY	SAMPLE DUPLI	CATE 13-1141				
				LCS	% Rec	
Parameter	Units	Results	Results Dup	% Rec	Limits	Qualifiers
Alkalinity	mg/L CaCO3	178.4	179.9	101%	85-115%	
pH SM4500-H+E	Results		QC Limits	Lab Stan	dard Number	
ICV Buffer 7.00	7.00		6.95-7.05	L11-000	2-0121	
ICV Buffer 4.00	3.95		3.95-4.05	L12-000		
ICV Buffer 10.01	10.04		9.96-10.06	L12-000		
CCV Buffer 10.00			9.96-10.06	L11-000		
CCV Buffer 4.05	3.99		3.95-4.05	L12-000	2-0048	
Slope	98.9%		90-102%			



QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.0

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

METHOD BLANK

Parameter

Sulfate

MATRIX:Water

Associated Lab Samples: L13-0001-1139,L13-0001-1140,L13-0001-1141

Blank Reporting
Units Result Limit Analyzed Qualifiers

mg/l ND 0.63 2/26/13

MATRIX SPIKE SAMPLE

SAMPLE NUMBER / NAME:

Parameter	Units	Results	MS Spike Conc	MS Results	MS % Rec	Rec Limits	Qual		
Sulfate 13-1139	mg/l	7.7	4	11.4	93%	75-125		 	**************************************

LABORATORY CONTROL SAMPLE

		Spike		LCS	% Rec	
Parameter	Units	Conc.	LCS Results	% Rec	Limits	Qualifiers
Sulfate	mg/l	5	4.4	88%	85-115	



QUALITY CONTROL DATA

SEMO PROJECT: Rivermines ANALYSIS METHOD: SM 2540D

ANALYSIS DESCRIPT		O Total suspended	Solids			
METHOD BLANK		MATRIX:Water				
Associated Lab Samples:	L13-0001-	1139,L13-0001-11	40,L13-0001	-1141		
Parameter	Units	Blank Result	Reporting Limit	Anal	yzed	Qualifiers
Total Suspended Solids	mg/l	ND	5	2/26	6/13	
LAB DUPLICATE						
SAMPLE NUMBER / N	AME:	13-1140				
Parameter	Units	Results	Dup		Qual	_
Total Suspended Solids	mg/l	2	1			•
LABORATORY CONTR	ROL SAMP	LE L13-0002-000	5			
		Spike		LCS	% Rec	
Parameter	Units	Conc.	LCS Results	% Rec	Limits	Qualifiers
Total Suspended Solids	mg/l	5	4.5	90%	85-115	
LABORATORY CONTR	ROL SAMP	LE L13-0002-000	5			
		Spike		LCS	% Rec	
Parameter	Units	Conc.	LCS Results	% Rec	Limits	Qualifiers
Total Suspended Solids	mg/l	5	4.5	90%	85-115	



QUALIFIERS

SEMO PROJECT

DEFINITIONS

Not Analyzed
Not detected/ below Method Detection Limit.
Potential false positive value based upon blank sample data validation procedures.
Estimated value, exceeded the instrument calibration range.
Recommended sample preservation, extraction or analysis holding time was
exceeded.
Lower than reporting limit and higher than MDL and is an estimated value.
Per client request, metals analysis was conducted less than 16 hours from
sample collection/preservation.
Estimated value, QA/QC criteria not met.
Unusable value, QA/QC criteria not met.
Dissolved result > than associated Total result.
1/100 Dilution
Filtered Samples prepared in the field.

ANALYTE QUALIFIERS

- H Analysis conducted outside the EPA method holding time.
- Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- RPD value was outside control limits.

NES Not enough sample.

Method	Analysts				
200.7	TLL				
Alka	AMM				
IC	TLL				
TSS	JAA				

Report Acceptance						
QAO	Date					
GWP	2/28/2013					
Manager	Date					
EJS	2/28/2013					

THE DOE RUN COMPANY

SEMO DIVISION -- CENTRAL LABORATORY

PO BOX 500 VIBURNUM, MISSOURI Ph 573-244-8105 Fax 573-244-8181

Sample	Lab	Sample Name	Pb	Zn	Cu	Cd	Ni	Tl	Fe	Alka	S04	P	TSS	pН	Turbidity
Date	Number		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	mg/l	mg/l	FAU
2/27/13	13-1172	RMP ROUGH T	2.1 J	12780^	2.8	ND	844	27	1418	183	793		1000	6.96	4
		RMP ROUGH D		12350^					1315			2.14.18	STATE OF THE		
2/27/13	13-1173	RMP POLISH T	2.9	10390^	0.54J	ND	778	27	263	179	807		ND	7.15	ND
		RMP POLISH D		10180^				ě,	249				是数据		
2/27/13	13-1174	RMP EFFLUENT T	7.2	10250^	2.7	0.38	704	27	252			0.07	31.0		12
		RMP EFFLUENT D		10420^***					124						

RL	2.7	0.91	0.97	0.38	0.86	1.4	2
MDL	0.85	0.28	0.3	0.12	0.27	0.58	0.34



SEMO PROJECT: Rivermines

ANALYSIS METHOD: EPA 200.7 ANALYSIS DESCRIPTION: 200.7 Metals, Total

METHOD BLANK

Associated Lab Samples: L13-0001-1172,L13-0001-1173,L13-0001-1174

	Units	Blank Result	RL	Analyzed	Qualifiers
Cadmium	ug/L	ND	0.38	2/27/13	
Copper	ug/L	ND	0.97	2/27/13	
Lead	ug/L	ND	2.7	2/27/13	
Zinc	ug/L	0.47	0.91	2/27/13	
Nickel	ug/L	0.16	0.86	2/27/13	
Thallium	ug/L	0.82	1.86	2/27/13	
Iron	ug/L	ND	2.0	2/27/13	

LABORATORY CONTROL SAMPLE, TOTAL

Parameter	Units	Spike Conc.	LCS Results	Rec	Limits Qualifiers
Cadmium	ug/L	500	528	106%	85-115%
Copper	ug/L	500	527	105%	85-115%
Lead	ug/L	500	526	105%	85-115%
Zinc	ug/L	500	535	107%	85-115%
Nickel	ug/L	500	538	108%	85-115%
Iron	ug/L	500	576	115%	85-115%

MATRIX SPIKE & MATRIX SPIKE DUPLICATE

SAMPLE NUMBER / NAME: 13-1172 1/100 dil

Parameter	Units	Results	Conc	Spike	Results	Results	Rec	Rec	Limits	Qual
Cadmium	ug/L	0	500	500	603	595	121%	119%	75-125%	
Copper	ug/L	0	500	500	451	448	90%	90%	75-125%	
Lead	ug/L	10	500	500	534	530	105%	104%	75-125%	
Zinc	ug/L	127	500	500	732	722	121%	119%	75-125%	
Nickel	ug/L	11	500	500	527	519	103%	102%	75-125%	
Iron	ug/L	0	500	500	532	540	106%	108%	75-125%	



(573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM 2320B

ANALYSIS DESCRIPTION: 2320B Alkalinity

METHOD	BLANK
14TT 1 1 1 O D	DELLIN

Associated Lab Samples: L13-0001-1172 L13-0001-1173 L13-0001-1174

Associated Lab Samples: L13-0001-1172,L13-0001-1173,L13-0001-1174						
Parameter	Units	Blank Result	Reporting Limit	Ana	lyzed	Qualifiers
Alkalinity	mg/L	0.5	5	2/2	7/13	
LABORATORY	CONTROL SAME	PI.F				 -
El Bold (1010)	CONTROL DI LVE	. 35		LCS	% Rec	
Parameter	Units	Spike Conc.	LCS Results	% Rec	Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	100.6	101%	85-115%	
LABORATORY	CONTROL SAME	PLE DUPLICATE				·
_				LCS	% Rec	
Parameter	Units	Spike Conc	LCS Results	% Rec	Limits	Qualifiers
Alkalinity	mg/L CaCO3	100	101.6	102%	85-115%	
LABORATORY	SAMPLE DUPLI	CATE 13-1172			···	···
				LCS	% Rec	
Parameter	Units	Results	Results Dup	% Rec	Limits	Qualifiers
Alkalinity	mg/L CaCO3	183.4	183.4	100%	85-115%	
pH SM4500-H+I Results			QC Limits	Lab Stan	dard Number	
ICV Buffer 7.00	7.00		6.95-7.05	L11-0002	2 0121	
ICV Buffer 4.00	,,,,		3.95-4.05	L12-0002		
	3.95					
ICV Buffer 10.01	10.04		9.96-10.06	L12-0002		
CCV Buffer 10.00			9.96-10.06	L11-0002		
CCV Buffer 4.05	3.99		3.95-4.05	L12-0002	2-0048	
Slope	98.9%		90-102%			



Sulfate

Quentin J. Schmidt Analytical Laboratory 43 Iron County Road No 1 Bldg 3 Viburnum, MO 65566 (573) 244-8105

QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: IC 300.00

mg/l

ANALYSIS DESCRIPTION: ION CHROMOTOGRAPH 300.0

ANAL I SIS DESCRIFTION. ION CHROMOTOGRAFTI 300.0						
METHOD BL	ANK .	MATRIX:Wat	er			
Associated Lab	Samples: L1	3-0001-1172,L	.13-0001-1173,L	.13-0001-	1174	
		Blank	Reporting			
Parameter	Units	Result	Limit	Ana	lyzed	Qualifiers
Sulfate	mg/l	ND	0.63	2/2	8/13	
MATRIX SI	MATRIX SPIKE SAMPLE					
SAMPLE NUMBER / NAME:						
			MS Spike	MS	MS	Rec
Parameter	Units	Results	Conc	Results	% Rec	Limits Qual
Sulfate 13-117	2 mg/l	7.9	4	11.5	90%	75-125
LABORATOR	Y CONTROI	L SAMPLE				
		Spike		LCS	% Rec	
Parameter	Units	Conc.	LCS Results	% Rec	Limits	Qualifiers

100% 85-115



QUALITY CONTROL DATA

SEMO PROJECT: Rivermines

ANALYSIS METHOD: SM2540D

Total Suspended Solids

ANALYSIS DESCRIPTION: SM2540D Total Suspended Solids

METHOD BLANK MATRIX:Water Associated Lab Samples: L13-0001-1172,L13-0001-1173,L13-0001-1174 Blank Reporting Qualifiers Parameter Units Result Limit Analyzed 5 Total Suspended Solids mg/l ND 2/27/13 LAB DUPLICATE SAMPLE NUMBER / NAME: 13-1174 Units Duplicate Qual Parameter Results Total Suspended Solids mg/l 31 32 LABORATORY CONTROL SAMPLE LCS % Rec Spike % Rec Limits Qualifiers Units Conc. LCS Results Parameter Total Suspended Solids 5 80% 85-115 mg/1LABORATORY CONTROL SAMPLE LCS % Rec Spike Parameter Units Conc. LCS Results % Rec Limits Qualifiers

6

120%

85-115

5

mg/l



QUALIFIERS SEMO PROJECT

DEFINITIONS

NA	Not Analyzed			
ND	Not detected/ below Method Detection Limit.			
В	Potential false positive value based upon blank sample data validation procedures.			
Е	Estimated value, exceeded the instrument calibration range.			
G	Recommended sample preservation, extraction or analysis holding time was exceeded.			
J	Lower than reporting limit and higher than MDL and is an estimated value.			
	Per client request, metals analysis was conducted less than 16 hours from			
K	sample collection/preservation.			
*	Estimated value, QA/QC criteria not met.			
**	Unusable value, QA/QC criteria not met.			
***	Dissolved result > than associated Total result.			
^	1/100 Dilution			
	Filtered Samples prepared in the field.			

ANALYTE QUALIFIERS

- H Analysis conducted outside the EPA method holding time.
- Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
- RPD value was outside control limits.

NES Not enough sample.

Method	Analysts
200.7	TLL
Alka	AMM
IC	TLL

Report Acceptance		
QAO	Date	
GWP	3/1/2013	
Manager	Date	
EJS	3/1/2013	